ADM
KARY

FEB 8 1937

PERSONNEL

PUBLISHED QUARTERLY BY THE AMERICAN MANAGEMENT ASSOCIATION
330 WEST 42ND STREET, NEW YORK, N. Y.

CONTENTS · FEBRUARY · 1937

ADJUSTING WAGES TO THE COST OF LIVING INDEX
Page 74 by Francis H. Bird

GENERAL ELECTRIC'S SUGGESTION SYSTEM
Page 78 by William E. Owen

A WAY TO REDUCE THE FATIGUE ALLOWANCE IN TIME STUDY
Page 83 by Harold C. Taylor

THE MODERN SALES MANAGER'S JOB
Page 93 by Burton Bigelow

TIREDNESS ..... by James H. Taylor
Page 102

SALARY SAVINGS ..... by Lloyd W. Klingman
Page 109

EMPLOYMENT TESTING ..... by Walter V. Clarke
Page 114

HELPING THE INJURED MAN BACK TO WORK
Page 118 by Carl Norcross

VOLUME 13

COPYRIGHT, 1937
AMERICAN MANAGEMENT ASSOCIATION

NUMBER 3

AMERICAN MANAGEMENT ASSOCIATION

Chairman of the Board—James O. McKinsey, *Chairman*, Marshall Field & Company, Chicago, Ill.
Chairman Finance Committee—Harold V. Cox, *Manager, Industrial Department*, Ford, Bacon & Davis, Inc., New York, New York.
President—Alvin E. Dodd, 330 W. 42nd Street, New York, New York
Treasurer—James L. Madden, *Third Vice-President*, Metropolitan Life Insurance Company, New York.
Secretary—Henry J. Howlett, 330 W. 42nd Street, New York, New York.

VICE-PRESIDENTS IN CHARGE OF DIVISIONS

Finance and Accounts—Mark M. Jones, *President*, Akron Belting Company, New York, New York.
Office Management—George L. Harris, *Manager, Sales Promotion and Education Department*, Addressograph-Multigraph Corporation, Cleveland, Ohio.
Personnel—Thomas G. Spates, *Director of Industrial Relations*, General Foods Corporation, New York.
Production—Earl M. Richards, *Assistant to Vice-President in Charge of Operations*, Republic Steel Corporation, Cleveland, Ohio.
Industrial Marketing—J. H. Macleod, *Vice-President, Sales Division*, The Hinde & Dauch Paper Co., Sandusky, Ohio.
Consumer Marketing—H. W. Dodge, *Vice-Presidents*, The Texas Company, New York, New York.
Insurance—T. W. Dinlocker, *Secretary and Treasurer*, SKF Industries, Inc., Philadelphia, Pa.
President of the Institute of Management—Carle M. Bigelow, The Calco Chemical Company Inc., Bound Brook, New Jersey.

VICE-PRESIDENTS AT LARGE

W. J. Donald, *Managing Director*, National Electrical Manufacturers Association, New York, New York.
W. A. Griffin, *Assistant Vice-President*, American Telephone and Telegraph Company, New York.
Thomas R. Jones, *President*, American Type Founders, Incorporated, Elizabeth, New Jersey.
Earl Whitehorne, *Assistant Vice-Presidents*, McGraw-Hill Publishing Company, Inc., New York.
Irwin D. Wolf, *Vice-President*, Kaufmann Department Stores, Inc., Pittsburgh, Pennsylvania.
Auguste Richard, *President*, The Spool Cotton Company, New York, New York.

PAST PRESIDENTS

W. W. Kincaid, *Chairman of the Board*, The Spirella Company, Inc., Niagara Falls, New York.
Sam A. Lewisohn, *Vice-Presidents*, Miami Copper Company, New York, New York.
F. L. Sweetser, *Partner*, Stevenson, Jordan & Harrison, New York, New York.
C. S. Ching, *Director of Industrial and Public Relations*, United States Rubber Company, New York.
W. J. Graham, *Vice-President*, The Equitable Life Assurance Society of the United States, New York.

BOARD OF DIRECTORS

Term Ending 1937

M. J. Beirn, *Vice-President and General Manager of Sales*, American Radiator & Standard Sanitary Corporation, New York, New York.
Clarence G. Stoll, *Vice-President*, Western Electric Company, Inc., New York, New York.
Miles E. Robertson, *General Manager*, Oneida Community, Ltd., Oneida, New York.
Glenn Gardiner, Forstmann Woolen Company, Passaic, New Jersey.
C. J. Hicks, Industrial Relations Counselors, Inc., New York, New York.
Chapin Hoskins, *Managing Editor, Forbes*, New York, New York.
Edgar Kobak, *Vice-President*, Lord & Thomas, New York, New York.
John A. Stevenson, *Vice-President*, The Penn Mutual Life Insurance Company, Philadelphia, Pa.
L. C. Stowell, *Executive Vice-President and Director*, Underwood Elliott Fisher Company, New York.

Term Ending 1938

Stanley P. Farwell, *President*, Business Research Corporation, Chicago, Illinois.
Stanley P. Fisher, *Assistant to Works Manager*, American Hard Rubber Company, New York, N. Y.
W. G. Marshall, *Vice-President*, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
Hadar Ortman, *President*, United Wall Paper Factories, Inc., Jersey City, New Jersey.
H. B. Bergen, *Director of Industrial Relations*, The Procter & Gamble Company, Ivorydale, Ohio.
George E. Rogers, *Insurance Manager*, Robert Gair Company, New York, New York.
I. O. Royse, *Manager, Office Production*, Ralston Purina Company, St. Louis, Missouri.
Ernest F. Rumpf, *Secretary-Comptroller*, F. C. Huyck & Sons, Albany, New York.
Edmond E. Lincoln, *Economist*, E. I. du Pont de Nemours & Company, Wilmington, Delaware.

Term Ending 1939

L. R. Boulware, *Vice-President and General Manager*, Carrier Corporation, Newark, New Jersey.
T. G. Graham, *First Vice-President*, B. F. Goodrich Company, Akron, Ohio.
Thomas J. Harte, *Vice-President and General Sales Manager*, North American Cement Corporation, New York, New York.
H. H. Leonard, *Vice-President and General Manager*, Consolidated Packaging Machinery Corporation, Buffalo, New York.
Ralph Kelly, *Vice-President*, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
James S. Kemper, *President*, Lumbermens Mutual Casualty Company, Chicago, Illinois.
J. Kindleberger, *Chairman of the Board*, Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.
C. J. Stilwell, *Vice-President*, The Warner & Swasey Company, Cleveland, Ohio.
Dr. Frank M. Surface, *In Charge of Research Sales Department*, Standard Oil Company of New Jersey, New York, New York.
C. A. Tattersall, *Secretary*, Niagara Hudson Power Corporation, New York, New York.

Editor—James O. Rice, 330 West 42nd Street, New York, New York.

PERSONNEL · · · · FEBRUARY · 1937

THIS ISSUE

IT IS READILY observable to anyone reviewing industrial progress of the past few months that the executive in charge of personnel and industrial relations is rising to a place of new importance in the management function. This is the phenomenon that demands comment and recognition over all the other developments that have crowded into the months since *Personnel* was last published.

The personnel officer has new and heavier responsibilities; vexing new problems confront him; his days are longer and busier. Our belief is that the average personnel executive has not been disconcerted by all this. In this situation he can stand upon the firm bedrock of study, research, and toil of past years. This investment has been long and consistently in the making; it cannot easily crumble.

This February, 1937, number of *Personnel* is presented as another contribution to personnel management. The pages that follow reveal much that is typical of the thinking behind modern personnel practice. The material included is unusually comprehensive; it ranges from selection tests to getting the injured workman back on the job, and on the way stops to examine sales training, suggestion systems, tiredness, fatigue allowances, cost of living, and salary savings.

Outstanding for timeliness and intrinsic worth is the contribution of Dr. Francis Bird on "Adjusting Wages to the Cost of Living." It is generally conceded that history usually gets around to repeating itself, and Dr. Bird believes that management should have a wholesome respect for the synchronization plan in preparation for the time when the events of 1918-20 are repeated.

As a pure coincidence, we have two men with the same last name writing on related subjects. These are the two Taylors, Harold C. and James H. The former, writing on the way to reduce fatigue allowance in time study, says that the time and length of rest periods should be specified in job standards; this will keep production at a higher level than when the worker rests either *less* or more than the specified amount or at any other times than those specified, providing, of course, that the proper rest periods are ascertained.

James H. Taylor writes on the more psychological problem of tiredness. He points out that tiredness must not be confused with physiological fatigue or with work decrement. Concurrently with reports of tiredness, production rates may remain the same or *increase*. He suggests means of minimizing, and in some cases eliminating, reports of tiredness.

The object of the publications of the American Management Association is to place before the members ideas which it is hoped may prove interesting and informative, but the Association does not stand sponsor for views expressed by authors in articles issued in or as its publications.

ADJUSTING WAGES TO THE COST OF LIVING INDEX

By FRANCIS H. BIRD
Professor of Commerce, University of Cincinnati

SHOULD management be particularly interested at this time in ways and means of synchronizing wages with the cost of living? My answer, based in part on previous practical experience in industry, would be emphatically "yes." And the reasons for the answer would be:

1. Preparedness, knowing how to act in case prices which enter into the cost of living go "skyrocketing" as they did back in 1918, 1919, and 1920.

2. Action, adopting promptly, if possible, a wise wage policy, should retail prices get out of control, thus avoiding the costly mistakes made by some representatives of management who waited too long to adjust wages back in 1918, 1919, and 1920. Investigation will show that an important cause of the labor unrest, with resultant curtailment of production, which was manifest throughout industry in the years mentioned was because management permitted too great a lag between wages and the rapidly mounting cost of living.[1]

Are prices going to get out of control in the near future? Will the cost of living rise rapidly? Who knows? With the economic setup as it is, inflation is possible, but it may not be probable. As I browse through the local evening paper, my eye catches a statement attributed to Winthrop W. Aldrich, Chairman of the Chase National Bank, in his annual report to the stockholders. He warns them that:

> The expansion of bank credit in the United States in 1936, as well as substantial commodity price increases in the fourth quarter of the year, have brought to the fore the question of controlling expansionist tendencies.
>
> Both experience and theory make it clear that, unless adequate monetary controls are invoked in time, our recovery can all too easily degenerate into a dangerous boom culminating in disaster.[2]

What is meant by the "cost of living" and what has it been doing recently? By "cost of living" is meant the expenses incurred by the typical workman in meeting his family budget. They include expenditures for food, shelter, clothing, house furnishing goods, fuel and light, and miscellaneous. The sum total of these expenses by a weighting method are put together in a composite figure which in turn is translated into an index number. By comparing an index number of the cost of living for one period with that of

[1] Perlman, Selig and Taft, Phillip. *History of Labor in the U. S.*, Volume IV, Macmillan, N. Y., 1935, p. 460.
Carr, Elma B. "The Use of Cost of Living Figures in Wage Adjustments." Bulletin U. S. Bureau of Labor Statistics, No. 369, Washington, 1925, pp. 7-338.

[2] *Cincinnati Times Star*, January 12, 1937.

another period it is possible to get an approximate idea of whether the trend of the cost of living is up or down in the interval.

What has the cost of living been doing recently? For this information we will refer to the U. S. Bureau of Labor Statistics, the best source available in the United States for cost of living figures. This government agency compiles and publishes every few months family budget cost of living index numbers based on prevailing prices in thirty-two cities located in different parts of the United States. The index numbers are prepared not only for each city, but a combined index number is derived from the averages of total family budget prices in each city, which may be taken as representative of the United States as a whole. Let us see what this combined index number which takes the average for the years 1923-1925 as 100 has to tell us about the recent movement of the cost of living in the United States.

In the year 1935, the index number for March 15 was 80.6; for July 15, 80.4; for October 15, 80.7. In the year 1936 it was for January 15, 81.3; for April 15, 80.6; for July 15, 82; for September 15, 82.4.[3] From November 17 to December 15, 1936 the retail cost of food in the United States went up one-half of one per cent.[4] Nothing to be alarmed about in these retail price figures one might conclude, but how about the wholesale prices? Wholesale prices tend to forecast a few months in advance the trend of retail prices. Wholesale prices have been accelerating recently, particularly those of farm products. Following the upward movement begun early in November, the all commodity wholesale price index of the U. S. Bureau of Labor Statistics rose seven-tenths of one per cent during the week ended January 2, 1937 to 84.7 per cent of the 1926 average, the highest point since June, 1930.[5] Compare the January 2, 1937 figure of 84.7 with the October, 1936 figure of 81.5 and the October, 1935 figure of 80.5.[6] It is evident that wholesale prices are starting upwards with an increasing velocity. If this movement continues, one might expect that the cost of living will start speeding upward, too, before 1937 is over.

How fast must the cost of living rise before it goads the employee to the point of asking for an increase in pay to keep the market basket at its customary level? Possibly past experience will help with the answer. On the basis of 100 for the year 1913, the cost of living index number for the United States as of December, 1917 was 138.3; for December, 1918, 166.9; for June, 1919, 171.1; for December, 1919, 191.4; for June, 1920, 211.3.[7]

As one studies these index numbers in retrospect it is not difficult to understand why cost of living labor troubles started in 1917 and continued into 1920 in those industrial establishments where periodic wage adjustment policies were not followed. If in some future six-months' period, the cost

[3] "Changes in Cost of Living, Sept. 15, 1936," U. S. Bureau of Labor Statistics, Serial No. R. 464, p. 8.
[4] U. S. Bureau of Labor Statistics, Release 4078, Jan. 7, 1937.
[5] U. S. Bureau of Labor Statistics, Release 4094, Jan. 7, 1937.
[6] Monthly Labor Review, U. S. Bureau of Labor Statistics. Dec., 1936, Table 3, p. 1601.
[7] "Changes in Cost of Living, Sept. 15, 1936," U. S. Bureau of Labor Statistics, Serial No. R. 464, p. 22.

of living should suddenly shoot up 5 per cent or more, the time may be at hand to consider a wage purchasing power stabilization program.

How can it be done? Again, past experience can point the way. The most comprehensive study of the use of cost of living figures in wage adjustments is that by Elma B. Carr, published as Bulletin 369 of the U. S. Bureau of Labor Statistics. Much useful information will be gained from a perusal of this document by anyone who is interested in this subject. One chapter is given over to the experience of individual companies as reflected in an analysis of the questionnaires returned to the U. S. Bureau of Labor Statistics in answer to its inquiries made in late 1921 and early 1922. It is interesting to note that of 2,311 private employers furnishing data, 1,370 made use of cost-of-living figures in connection with wage adjustments. Over one and a half million employees were affected to a greater or less degree. Not all employers used cost-of-living figures successfully. Their failure appears to have been through the use of faulty technique. The survey would indicate on the whole successful experience by employers. Next to the U. S. Bureau of Labor Statistics the National Industrial Conference Board was chosen as a source for cost-of-living data. In some cases the employers compiled their own figures, but this was only as a last resort when other data were not judged practicable for their specific use.

Cost-of-living adjustments were made monthly, quarterly, semi-annually, sporadically, depending upon the particular establishment. Employees showed a preference for cost-of-living adjustments in the regular pay envelope instead of in the form of a bonus at the end of a month or some longer period. They preferred to know in advance how much the cost-of-living adjustment was going to affect their wages.

For those who may desire to make cost-of-living wage adjustments in the future the following suggestions for procedure are offered based on methods found useful in the past:

A. *Conference method*

Most large concerns today have some form of employee representation. In establishments of this kind management might:

1. Establish definite procedure for cost-of-living wage adjustments in advance through joint conference with representatives of employees.

This will assure employees of intention of the management, as far as possible, to stabilize purchasing power of wages. It will give them confidence in procedure to be followed because they helped work it out and understand it.

2. Agree on an established impartial source of cost-of-living figures.

By agreeing in advance upon a published index number as indicative of the cost-of-living at a given date and to be used as a basis for comparison with a similar index number at a later date, misunderstanding and argument are forestalled at such time as it may be necessary to use cost-of-living figures to adjust wages. When available, the figures of the U. S. Bureau

of Labor Statistics would probably prove most acceptable. Next would come those of the National Industrial Conference Board.

3. Agree in advance, if practicable, upon a reliable statistician to be called in case of a wage adjustment.

A consulting statistician in whom both management and employees have confidence can be very useful when a wage adjustment is pending. He can help work out the technical steps in accordance with the agreed upon procedure. Shifting bases, percentage calculations and index numbers are sometimes difficult for both management and men to understand. A statistician can explain the technicalities and guard against error in the use of cost-of-living figures.

4. Record in advance the conditions under which periodic automatic wage adjustments may be made and the procedure to be followed.

A memorandum of agreement as follows might be indicative of what is desired in order to provide for a clear understanding of what is to be done and how:

"If the cost-of-living figures of the U. S. Bureau of Labor Statistics as specified in this memorandum show that six months from date, and at intervals of six months thereafter, the cost of living has increased 5 per cent or more in any six-month interval, it is understood that wage rates of the X Corporation will be readjusted to provide for the increase in the cost of living as indicated at any six-month interval. It is understood further, that if the cost of living has decreased 5 per cent or more in any six-month interval occurring after a six-month interval where it has increased 5 per cent or more, the wage rates of the X Corporation may be readjusted to provide for the decrease in the cost of living as indicated in such six-month interval."

This rough draft is suggestive only. Note that provision is made for readjustment of wages downward as well as upward. Rapidly rising prices are usually followed by rapidly falling prices. Management must have this in mind and the employees should be shown in advance that out of fairness to both management and men provision for wage adjustments both up and down should be agreed upon.

5. Record all figures and mathematical calculations in a memorandum for future reference each time a wage adjustment is made.

This will avoid disagreement as to just how adjustments were arrived at in the past.

6. Publicize the method of making wage adjustments through the house organ, bulletin boards and other media.

This will acquaint the rank and file of employees as to just how the plan works.[8]

[8] For a detailed description of one procedure actually used in cost of living wage adjustments see: Bird, Francis H., "The Cost of Living as a Factor in Wage Adjustments in the Book and Job Branch of the Chicago Printing Industry," American Economic Review, December, 1921, pp. 622-642.

B. *Non-conference method*

When management assumes sole responsibility for cost-of-living wage adjustments the following procedure is suggested:

1. Adopt a reliable source of cost-of-living figures.
2. Work out a simple automatic wage adjustment plan.
3. Announce the plan to employees in advance in such a way that they understand it.
4. Keep employees informed as to changes in the cost-of-living index.
5. Explain to employees, if wage adjustment is made, how it was made.

The automatic cost-of-living wage adjustment procedure discussed in this article is to meet emergency conditions, should they arise. Industry, of course, will be better off in the long run if price inflation is avoided.

85,000 BETTER IDEAS

The Story of General Electric's Suggestion System

By WILLIAM E. OWEN
General Secretary of Suggestion Committee, General Electric Company

THE General Electric suggestion plan was inaugurated about a quarter of a century ago, immediately after the plant manager at the Schenectady Works "headed-off" the discharge of a workman in one of the tool rooms who had been fired by his foreman (one of the old school) for annoying him by persistently proposing various changes on the equipment under the foreman's supervision. This workman was not one of the easily discouraged type. Before getting his time and leaving the plant, he took his case to the manager. His proposal was interesting enough to cause the manager to visit the shop and go into the situation personally. The result was the workman was not fired, but was given a chance to demonstrate his suggestions. Incidentally, this employee is still with General Electric, and has had more than one hundred patents granted to him. He is now the engineer in charge of one of the largest departments of the company and is one of the country's leading mechanical authorities.

It was with the idea of preventing a recurrence of such an incident that the plant manager organized a suggestion committee, to whom any employee could submit constructive suggestions. The committee was empowered to adopt all worth while ideas, and make suitable cash awards to the suggestors.

The plan soon spread to other plants of the company, and for the past 15 years or more all G-E works have had suggestion plans in effect. The one-time workman who was directly responsible for the inauguration of the suggestion system in General Electric, later on was appointed chairman of the suggestion committee, and continued in this capacity for a number of

years, until his duties as department head made it impossible for him to devote the time to the work.

In the early days the suggestion system met with opposition, particularly from persons in minor supervisory capacities who seemed to feel that suggestions from persons under them reflected on their ability. Breaking down this feeling was a long and difficult task. There were repeated declarations on the part of the management that suggestions should be encouraged; and there was tactful handling of each suggestion that did bring out the fact that the foreman or supervisor had been negligent in some respect. Opposition on the part of the supervisors was gradually eliminated, and today more suggestions are received from those departments having the highest efficiency ratings.

It was also difficult in the early days of the suggestion plan to get employees to make suggestions. There was a feeling on their part that their suggestions would be resented by their immediate superiors, and that sooner or later they would find themselves discriminated against. It has always been the practice of the suggestion committee to make certain that no discrimination takes place, and this feeling of the employees has practically vanished.

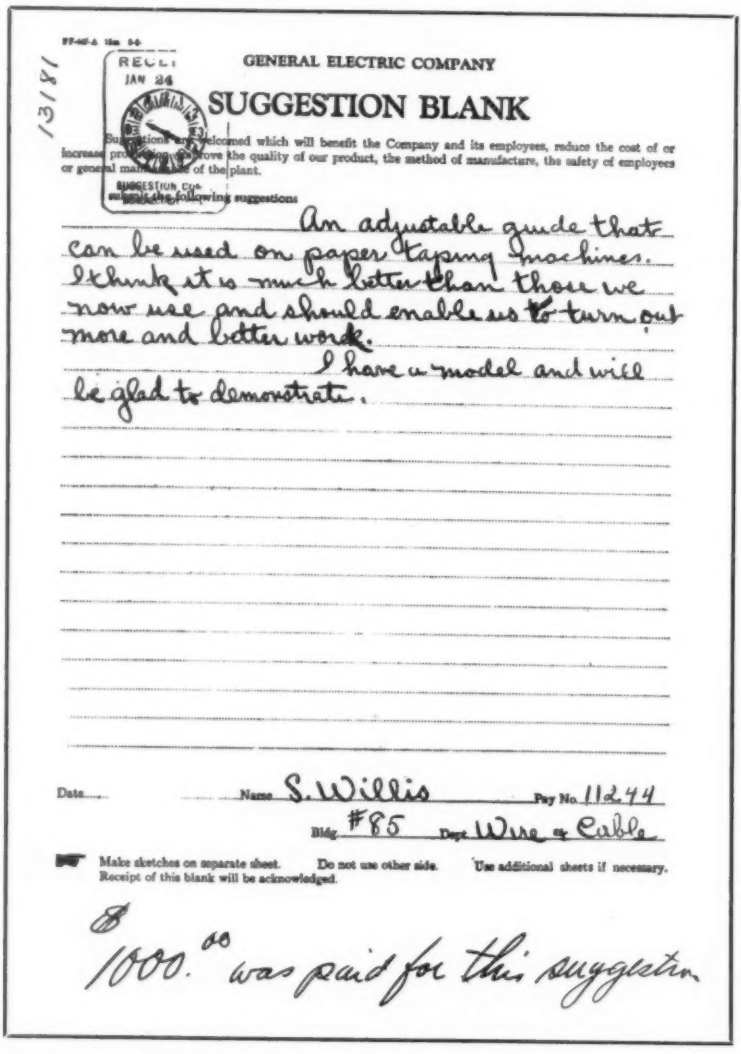
At first there were numerous suggestions which had very little connection with the company's business. All sorts of gadgets and schemes were proposed. However, by a constant educational plan, employees have been trained to confine their suggestions to phases of manufacturing, design, or plant administration. This has been a gradual process and naturally has taken time. However, more than 98 per cent of all suggestions submitted are now of the desired types.

The suggestion committee does not adopt or reject suggestions. It acts as a clearing house for all ideas submitted by employees, and passes them on to the respective department heads. The department head, after due investigation, reports back to the suggestion committee and if, in the committee's opinion, the suggestion has been properly investigated, the committee closes the matter with the suggestor. If not adopted, it explains in detail why not. If adopted it decides on a suitable award.

The award is based on a number of factors: First, the saving, if any; second, the value of the improvement if it deals with a change in design; and third, the novelty or ingenuity of the idea. There is no definite amount of award for any type of suggestion. This is left to the discretion of the suggestion committee. All adopted suggestions are paid for, the awards granted ranging from $2 up. The highest award so far paid was $1,500. The minimum award for any suggestion other than a minor safety one is $5; the minimum award for safety suggestions is $2. However, awards as high as $250 have been paid for suggestions dealing with safety. A large number of employees have been able to add very materially to their earnings through suggestion awards. In some instances, these awards have been nearly equal to the employees' wages. The average award for each adopted suggestion is approximately $11.

It is the duty of the suggestion committee to see that the investigation of an employee's suggestion is not unduly delayed. An effort is made to have a definite answer back to the suggestor within two weeks of the time the suggestion is submitted. The average time is slightly less than two weeks, although some suggestions require as long as a year to develop and try out.

Although many thousands of suggestions are received each year, very



GENERAL ELECTRIC COMPANY

RECD JAN 24

13181

SUGGESTION BLANK

Suggestions are welcomed which will benefit the Company and its employees, reduce the cost of or increase production, improve the quality of our product, the method of manufacture, the safety of employees or general maintenance of the plant.

SUGGESTION Co.
submits the following suggestions:

An adjustable guide that can be used on paper taping machines. I think it is much better than those we now use and should enable us to turn out more and better work.

I have a model and will be glad to demonstrate.

Date ..... Name S. Willis Pay No. 11244

Bldg. #85 Dept. Wire & Cable

Make sketches on separate sheet. Do not use other side. Use additional sheets if necessary. Receipt of this blank will be acknowledged.

$ 1000.00 was paid for this suggestion

few of a patentable nature are found. In case the suggestion should deal with something patentable, it is handled separately and turned over to the patent department for further action.

In practically every instance, the suggestion has no value to the employee unless he turns it over to the suggestion committee. Practically none

of the many thousands of suggestions submitted would be of value to any other concern.

The suggestions submitted over a number of years show the following classifications: Those dealing with improvements in manufacturing methods, 65 per cent; with changes in design, 20 per cent; shipping, packing, elimination of spoilage and waste, 8 per cent; safety and improved working conditions for employees, 5 per cent; and miscellaneous, 2 per cent.

The personnel of the suggestion committee varies in the different G-E plants, but it usually consists of a member of the manager's staff, together with members of the manufacturing and engineering organizations. These committees have no definite term of service, and most of them have been functioning ten years or more without a change in personnel. There is a definite advantage in having a permanent committee, as it takes several years to gain the background of experience which is so useful in dealing with and evaluating the many types of suggestions. The Schenectady Works committee, representative of most of the committees, is composed of the general superintendent, the assistant to the manager in charge of engineering, and several experts on electrical and mechanical processes. This committee meets weekly, regardless of the number of suggestions ready for action. By holding meetings regularly, undue time between the submission and the report on the suggestion is kept to a minimum. There is a minimum of "red tape" in the conduct of the suggestion committee's work. The committee is not hedged-in with limitations, and is empowered to handle all suggestions so that both the suggestors and the departments interested are satisfied.

Occasionally a suggestor feels that the amount of award granted is not commensurate with the value of the suggestion, or that the suggestion has not been thoroughly investigated. In such cases, the committee goes over the matter again. It is occasionally found that the suggestor is correct in his contention, and the case is then adjusted.

The early records of the suggestion committee are not available, but since 1920 General Electric has received 251,000 suggestions. Of these, 85,000 have been adopted and approximately $1,000,000 in awards paid. Nearly one-third of all suggestions submitted each year are accepted. Recently this percentage has increased somewhat, probably because care has been taken to educate employees as to the types of suggestions which are desired.

It requires constant effort to maintain a steady flow of suggestions. This is done by posting bulletins on the suggestion boxes located conveniently throughout the shops. These bulletins emphasize different points regarding suggestions, and are replaced about once a month. The works papers also give lists of successful suggestors, with the amounts of awards paid and photographs of those receiving the larger awards. This publicity is supplemented by talks before foremen's groups; and the subject of suggestions is usually included as a part of the foremen's training classes.

Contests have been tried several times, but they did not prove to be

desirable. The over-all number of suggestions received during the year was not materially increased and the large influx which were received during the campaign made it difficult to investigate each one properly. There was also a falling-off after the campaign was concluded.

Each adopted suggestion is paid for as soon as it is adopted. An estimate is made in case data covering cost and other details are not available, and a preliminary award is granted; an additional award is made later if it is found that the benefits are larger than were anticipated.

The suggestion plan occasionally brings to light some excellent talent. A number of employees who are now department heads have been brought into prominence by their suggestions. It is likely that they would have forged to the front regardless of whether or not there had been a suggestion plan, but it unquestionably helped focus attention on those individuals because of the quantity and quality of their suggestions.

It has been found that the largest number of suggestions come from departments which manufacture wide varieties of apparatus. This is natural, since the multiplicity of designs gives a great deal more opportunity for suggestors than some one piece of apparatus having relatively few parts. For instance, more suggestions will be received from a given number of employees in such departments as wiring supplies or control apparatus than from some similar number of employees in a turbine manufacturing department. However, the caliber of the suggestions from the turbine department may be better and of more value. It has also been found that the much vaunted Yankee ingenuity does not show up very strongly. It is true that more suggestions are obtained from a group of native Americans than from foreign-born workers, but the difference is not as great as might be expected. Some of the most ingenious and valuable suggestions have been sent in by foreign-born employees who, in many instances, could not write their own names.

It was the assumption, when the suggestion system was started, that employees would quickly run out of ideas after they had submitted those that had been on their minds for some time. Experience, however, has shown that the constant changes which are being made to improve designs and the bringing out of new apparatus give constantly new fields for suggestions. Giving each employee not only the opportunity but also the encouragement to criticize constructively every phase of design, manufacture, and supervision, adds greatly to the maintenance of high standards.

Whatever success the General Electric Company has had with its suggestion plan has been mainly because the plan is kept a live issue and officials of the company have maintained an interest in it from the start. Another factor is the willingness to pay liberally for each adopted suggestion. Also contributing to the success of the plan is the fact that no discrimination is made against any employee for submitting suggestions nor is any supervisor penalized because a suggestion may bring to light some oversight on his part.

A WAY TO REDUCE THE FATIGUE ALLOWANCE IN TIME STUDY

By HAROLD C. TAYLOR

OUTPUT ordinarily falls during the working day. That which is supposed to be the cause of this drop is usually called "fatigue." The time-study engineer allows for this drop in output by adding to the standard he sets for an operation a certain amount of extra time which he calls the "fatigue allowance."

An important aim of the engineer is to maintain or increase the rate of output. To achieve this end, he standardizes layout and motion sequences so that the operation can be done as quickly as possible. It is the purpose of this paper to discuss an aspect of standardization not widely used by time-study engineers. It is possible to reduce the fatigue allowance and thus to increase output by *standardizing the time and length of rest periods.*

WHAT IS FATIGUE?

What does the engineer mean by fatigue? There are three quite different meanings attached to the word. As a term to describe what happens to a person when he continues to repeat an operation without sufficient rest, it may mean that:

1. some *physiological change* occurs, such that his muscles are no longer able to function as fast or as well as they did at first.
2. *he feels more and more tired.*
3. *his output decreases* in quantity, or quality, or both.

These three types of so-called fatigue are not very closely related. When physiological fatigue is pronounced, feelings of fatigue and decreased output will ordinarily be found. But a person may feel tired when no evidence can be found of physiological fatigue. He may feel tired while his output rate is either rising or falling. His output curve may show characteristics which do not parallel his feelings of fatigue as Poffenberger has illustrated (*see* Figure 1). Throughout a work period his output curve may be falling when there is no evidence of physical fatigue. The use of the term fatigue to refer to these three relatively unrelated matters has caused much confusion.

A *decrease in output* is the definition which the engineer uses in practice. It is a fact, which can easily be observed, that output falls during a work period. One may infer that the worker has undergone physiological changes or that he feels tired. One may make physiological studies, or studies of fatigue feelings, but this is seldom possible in time-study work. The observable fact that output falls lies back of the fatigue allowance.

WHAT IS THE FATIGUE ALLOWANCE?

Present practice in assigning fatigue allowances may be summarized

briefly. At some point in his calculations for a given operation, the time-study engineer arrives at a standard time which should be maintained by a properly selected workman throughout a work period, if it were not for fatigue. Recognizing that this pace will not be maintained throughout the day, the engineer then increases the standard time by a percentage which, in

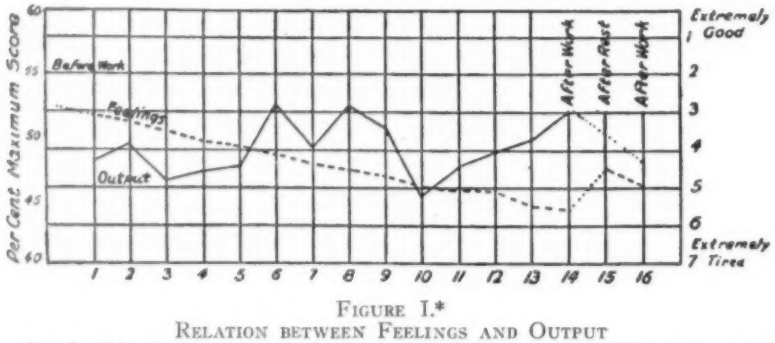


FIGURE I.*
RELATION BETWEEN FEELINGS AND OUTPUT
(Note that in this study, although feelings of fatigue were becoming more pronounced during the work spell, output was actually increasing.)

his opinion, will yield a standard which can be maintained throughout the work period. This percentage is the fatigue allowance. A fatigue allowance may be interpreted in at least two very different ways:

1. It may mean that the ordinary workman will need to rest a certain percentage of his time in order to maintain the original standard time, throughout the day.
2. It may mean that because of fatigue the worker is using a certain percentage of time in some unknown way. He may either be slowing down or be resting sufficiently during the day to make his actual average time per unit that much greater than the original standard time.

Clearly, the second definition is the correct one. Ordinarily, it is not known when the workman rests, how long he rests, or whether he rests at all. All that is known is that, on such operations, something which has been called fatigue so operates that throughout the work period the operation is really going to take that much longer than it should if fatigue were absent. Perhaps the workman is not resting at all and is therefore slowing up markedly. Perhaps he is resting too long, or too often, or not long enough, or not often enough. The fatigue allowance does not point to the answer. Perhaps if the worker rested even a smaller percentage of the time than the standard allowed, at proper intervals, he could maintain the original standard time per piece.

The fatigue allowance, then, is a factor of such size as to permit the final standard to be maintained throughout the work spell. One cannot be

* Poffenberger, A. T. *Applied Psychology.* New York: D. Appleton and Company, 1931. Fig. 6, p. 135. (Reproduced by permission of the copyright holders, D. Appleton-Century Company.)

sure that it is the amount of time which is used for rest or that it is the amount of time which ought to be used for rest.

Nevertheless, there is evidence that the size of fatigue allowances could be reduced and production therefore increased if the fatigue allowance did specify the time and length of rests. Before discussing this evidence, it will be useful to consider more fully the nature of fatigue in industry. The three different meanings of the term fatigue have led to widespread confusion. While the engineer is concerned over the drop in output which occurs during the work period, the fact that this drop has been called fatigue has been unfortunate. Because the word has often implied physiological changes, the inference has been drawn that physiological studies would be necessary in its reduction. Since such studies use techniques which are complicated, they have been considered impractical. It will be shown that the drop in output with which the engineer is concerned may be studied directly, without recourse to indirect measures of physiological changes or feelings of fatigue. Let us examine physiological fatigue, feelings of fatigue, and decrease in output with the needs of the time-study engineer in mind.

IS PHYSIOLOGICAL FATIGUE IMPORTANT IN INDUSTRY?

How prevalent is physiological fatigue in industry? Physiological fatigue involves the accumulation in the muscles, during continuous work, of certain substances which reduce the capacity of the muscle to act. If the rate of work is below a certain point, the organism is capable of carrying off these fatigue products as rapidly as they are made. If work is done at a faster rate, these substances continue to accumulate and eventually cause complete loss of the muscle's capacity to act. During subsequent rest, the fatigue products are removed and the muscle's power to act is restored. This type of fatigue is commonly measured indirectly by determining blood pressure, pulse rate, and oxygen consumption.

Concerning the importance of physiological fatigue in industry, D. B. Dill states, "It is safe to say that the usual factory worker rarely manifests fatigue from any of these [physiological] causes because his output of physical energy is but a small fraction of his capacity."[1] Apparently, then, physiological investigations of fatigue in industrial work may prove to be of little practical use.

The statement that physiological fatigue is not prevalent in industry must not be taken as a denial of the whole problem. Unquestionably, people get feelings of fatigue during the day's work. Unquestionably, the course of output curves is generally downward. The statement is given simply because it indicates that physiological measures may not yield much useful information in industry. In particular, they may not be widely applicable in determining the proper time for rest, if the type of fatigue they measure is not present.

[1] Dill, D. B., "The Nature of Fatigue," *Personnel*, IX (May, 1933), p. 116.

A word of caution may be given regarding physiological studies of the most efficient rate at which work should be done. By "most efficient" the physiologist means that speed at which the amount of energy used by the human organism per unit of work accomplished is a minimum. By "most efficient" the industrial engineer means that speed at which the greatest number of units per day will be produced without impairment of the health or morale of the worker. F. W. Taylor's definition of a full day's work was "the best day's work that a man could properly do, year in and year out, and still thrive under." The physiologist may find that at a production rate of 100 units per day the human machine is most efficient in his sense. But by proper organization of the work and proper provision for rest, the employee may produce 110 units per day. He may use considerably more heat energy per unit of work than he would at the physiologically most efficient rate, but this is not detrimental to the worker or to society provided he is working at a rate which he is able to maintain comfortably. It is this latter figure which the engineer needs to know, and a physiological study of the type mentioned does not help much in arriving at it.

It appears, then, that neither in the reduction of fatigue allowances through determination of proper rest pauses nor in the discovery of the most efficient speeds of work is industry likely to be able to make much direct use of physiological measures of fatigue.

SHOULD FEELINGS OF FATIGUE BE STUDIED?

To turn to the second definition of fatigue, namely, *feelings* of fatigue: What is its importance in industry? Viteles has summarized this matter as follows: "Unfortunately, the feeling of fatigue represents an amorphous combination of diverse factors such as 'dislike for a continuation of work,' 'lassitude,' 'weariness,' a 'feeling of effort in directing attention upon the task and its control,' 'limp sensations,' 'laziness,' 'changes in emotional attitude,' with perhaps a desire for rest or repose as the only common factor . . . it does not serve as an index of the physiological state of the body or of its capacity for continued work. A short walk, involving actually little use of muscles, may produce a pronounced feeling of fatigue in an individual who may dance all night without complaint. Another may be on the verge of complete exhaustion, as a result of overwork, without feeling fatigued. Laboratory investigations have shown that a given task may be done as rapidly and as accurately when the subject reports a feeling of fatigue as when consciousness of fatigue is altogether absent . . . it is not difficult to agree with investigators in this field in their unwillingness to accept the feeling of fatigue as a valid basis for judging the effect of work upon the efficiency and adjustment of the individual in the industrial and other situations."[2]

Thus it appears that the study of feelings of fatigue, like the study of

[2] Viteles, Morris S. *Industrial Psychology.* New York: W. W. Norton & Company, 1932. pp. 456-58.

physiological fatigue, may not, in general, yield the information needed in allocating proper rest periods in industry.

IS DECREASE IN OUTPUT A USEFUL MEASURE OF FATIGUE?

The third definition of fatigue is *that decrease in output which occurs when a task is performed for a period of time without sufficient rest.* This is a practical definition. It implies nothing regarding the cause of such a decrease in output. Scientists have, however, found it useful. It expresses the fact that, whether physiological fatigue is present or absent, whether feelings of fatigue occur or not, the general direction of output curves during a work spell is usually downward. In order to avoid confusion from the use of the term "fatigue," this characteristic of work curves is called "general decrement."

This is a useful viewpoint in industry. If it is realized that physiological fatigue is sufficiently rare as not to be a major problem, and that feelings of fatigue are a poor indicator of anything else, it will be clear that industry's chief concern with "industrial fatigue" is a concern with "general decrement." It is a concern over the fact that production declines during a work period. It is of importance to a cost-minded management and to a workman whose pay-check varies with his production, that production be kept at a maximum—that the general decrement of production curves be reduced as much as possible.

WHY NOT STUDY WORK CURVES?

It has been found useful, both in laboratories and in industry, to study general decrement directly by studying output curves. This decrement may be influenced by any combination of innumerable factors, such as inadequacies in lighting, ventilation, heating, supervision, food, arrangement of work, variety of work, incentive, provision for rest, or social organization. There may or may not be evidences of physical fatigue or feelings of fatigue. The important point is that since there is no single thing which causes work decrement, no useful purpose is served by lumping all these factors together and calling the result fatigue. In fact, great confusion is caused by doing so, because then one comes to believe that he is looking for some single thing which he should be able to locate and remove.

The most profitable procedure is to maintain detailed production records and, whenever general decrement occurs, to accept it simply as a fact. Then, without any preconceived notions about the nature of "fatigue," one may proceed to alter systematically any conditions which past experience, survey of existing circumstances, or opinions of workers may show to be undesirable. One then checks the correctness of his changes by noting their effect upon output.

WILL REST-PAUSES CHECK THE DECLINE IN PRODUCTION?

Of all the factors which may influence general decrement, we are here

interested chiefly in the effect of rest. It is significant that, regardless of the "cause" of work decrement, regardless of any other factors which are affecting it, it is generally true that *the work decrement can be reduced by rest.*

We have now cleared the ground by showing that it would be very useful to express fatigue or decrement allowances in terms of the amount of rest which should be specified in order to maintain high production; that this amount of rest should be determined not by physiological study or by study of the feelings of fatigue, but by direct study of output curves; and that, regardless of the cause of decrement, it can ordinarily be reduced by rest. We may now discuss the chief findings regarding the effect of rest pauses in laboratory and industrial situations.

IS THERE AN OPTIMUM AMOUNT OF REST?

An experiment of Vernon's illustrates the effect of various amounts of rest on total production.[3] He had a task performed for a fixed period of time. Following this, a rest period was given, the duration of which was 17, 33, 67, or 100 per cent of the work period. He then calculated the total output in a work period of given length, consisting of alternate work and rest in the proportions stated. Taking output with no rest as 100, the total output under each of the other conditions was 105, 108, 102, and 94 respectively. Thus, output was at a maximum when the length of the rest period was 33 per cent of the length of the working period. This and other experiments demonstrate that, when work is done under given conditions, there is an optimum amount of rest, in the sense that if that amount of rest is taken, total production will be greater during the work period than if either more or less rest is taken.

IS THERE AN OPTIMUM DISTRIBUTION OF REST?

An industrial experiment illustrates the effect of different distributions of rest upon total output. Wyatt reports: "In a particular job it was found that when the workers took spontaneous rests they produced 16 pieces per hour; when working 25 minutes and resting 5 they produced 18 pieces; when working 17 minutes and resting 3 they produced 22 pieces; and when working 10 and resting 2 they produced 25 pieces per hour. Thus, for a given fraction of the total time devoted to rest-pauses, the output increased with the frequency of the pause, and further experiments might have revealed even more favorable conditions."[4] Such findings as these demonstrate that, under given conditions, there is an optimum distribution of the rest-allowance in the sense that if the proper amount of rest is so distributed, total output during the work period will be greater than if the rest is taken at any other times.

---

[3] Industrial Fatigue Research Board, Report No. 29. Vernon, H. M., "The Influence of Rest-pauses and Changes of Posture on the Capacity for Muscular Work," *The Effects of Posture and Rest in Muscular Work*, Part B. London, England: His Majesty's Stationery Office, 1924. pp. 28-55.

[4] Industrial Fatigue Research Board, Report No. 42. Wyatt, S. *Rest-Pauses in Industry*. London, England: His Majesty's Stationery Office, 1927. pp. 6-7.

DO WORKERS SLOW UP JUST BEFORE A REST PERIOD?

Not only is output after a rest increased, but improvement also takes place even before the rest occurs. An example of this is given by Wyatt and Fraser (*see* Figure II). In the output curves of each worker shown, production was higher before the rest period than at other comparable times when no rest was approaching. It is obvious that the work decrement which occurs in such a case as this cannot be due to actual physical fatigue, since it is in part removed by a rest period which has not yet been taken.

IS THERE AN OPTIMUM WORK ASSIGNMENT?

Part of the explanation of this value of rest pauses lies in another principle which appears probable, although the evidence is not as yet complete: a man's rate of output may depend upon the amount of work assigned. When a long operation is broken up into smaller parts, each to be assigned to the worker as he finishes the preceding one, it will be found that there is an optimum length for each assignment, in the sense that if the assignment is either longer or shorter, the worker's rate of output on that unit will be less than when the unit is of proper length. Rest periods at proper intervals serve to break up the day's work into separate units, each of approximately optimum size. Evidence indicates that it is better, when possible, to break the assignments into units of amount, rather than units of time.[5]

DOESN'T THE WORKMAN HIMSELF KNOW WHEN TO REST?

Considerable evidence indicates that a workman cannot be expected to find the best balance of work and rest for himself. In an example cited previously, output was over 50 per cent greater when proper rest periods were taken than when the workers were left to their own devices. F. W. Taylor says, discussing an operation involving physiological fatigue, "If Schmidt had been allowed to attack the pile of 47 tons of pig iron without the guidance or directions of a man who understood the art, or science, of handling pig iron, in his desire to earn his high wages he would probably have tired himself out by 11 or 12 o'clock in the day. He would have kept so steadily at work that his muscles would not have had the proper periods of rest absolutely needed for recuperation, and he would have been completely exhausted early in the day. By having a man, however, who understood this law, stand over him and direct his work, day after day, until he acquired the habit of resting at proper intervals, he was able to work at an even gait all day long without unduly tiring himself."[6] While this may be exaggerated, science bears out Taylor's point that the worker does not spontaneously alternate work and rest in the proper proportions and at proper times.

---

[5] Bills, Arthur Gilbert, and Brown, Clarence, "The Quantitative Set," *Journal of Experimental Psychology*, XII (August, 1929), pp. 301-23.

[6] Taylor, Frederick Winslow. *The Principles of Scientific Management*. New York: Harper & Brothers, 1919. p. 59.

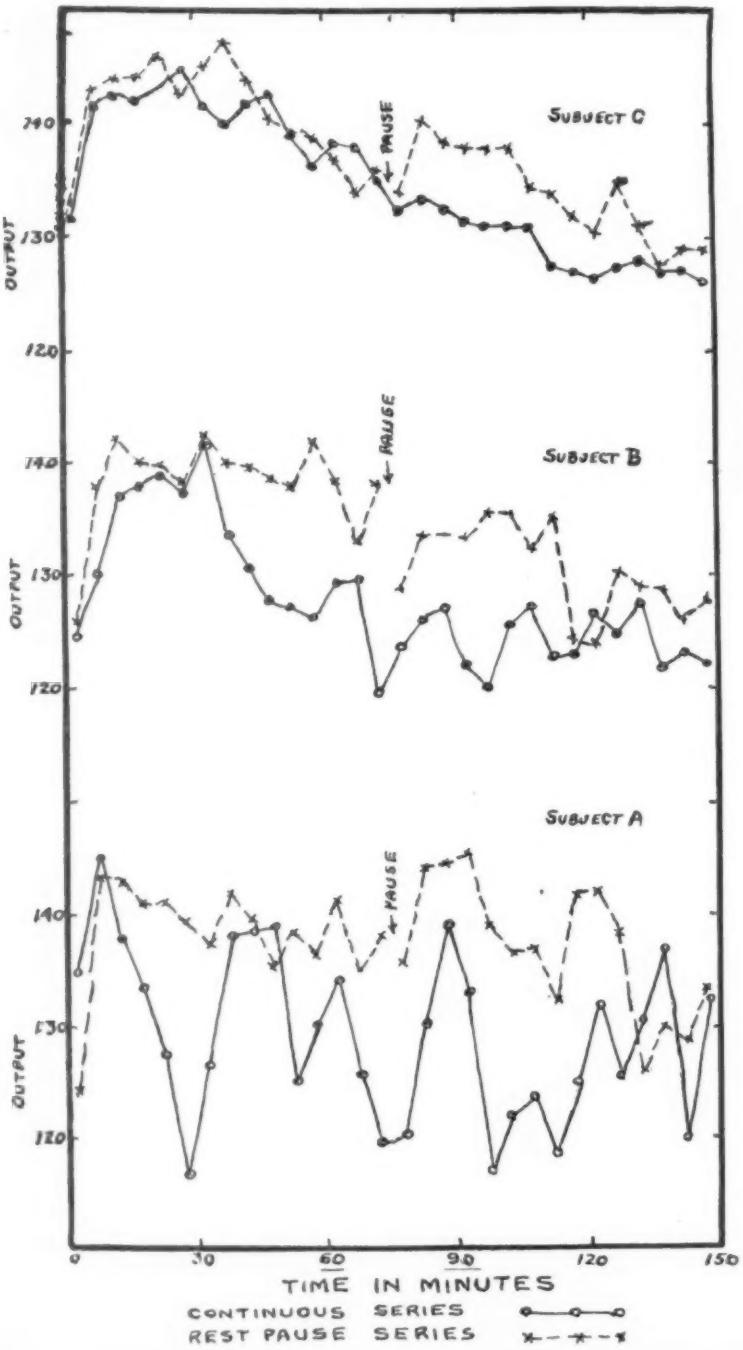


FIGURE II.*

EFFECTS OF A REST-PAUSE DURING THE WORK PERIOD (In the output curves of each of these three workers, production was higher *before* the rest period than if no rest was to be given.)

* Industrial Fatigue Research Board, Report No. 32. Wyatt, S., and Fraser, J. A. *Studies in Repetitive Work with Special Reference to Rest-Pauses.* London England: His Majesty's Stationery Office, 1925. p. 35.

It will be recalled that one of the important discoveries growing out of the study of work decrement is that there is not a very close relationship between the "feelings of fatigue" and the extent to which output has fallen off. One may, for example, feel tired while output continues to be maintained at a high level. This helps to explain why workmen cannot locate accurately the times at which they should rest.

In any case, it will not be surprising to the student of scientific management that workmen are unable to allocate for themselves proper periods of alternate work and rest. Like other work habits, the habit of properly alternating work and rest requires study. In the field of motion analysis, engineers have doubtless observed hundreds of common operations, performed by generation after generation of craftsmen, in which the motion sequences in general use were faulty. The motion analyst can make improvements which in the entire history of the craft have not taken place without his study. When to this technique he adds the study of the factors influencing work decrement, still further advances in production and in morale should result.

DOES THE STUDY OF REST PAUSES FIT IN WITH OTHER PRINCIPLES OF MANAGEMENT?

It is implied in the foregoing that there are optimum points with respect to the duration and frequency of rest pauses and the length of the unit assigned. This is clearly in accord with the experience of F. W. Taylor, the Gilbreths, and others who have applied the principles of scientific management. It is in accord with H. A. Hopf's recent analysis of size, cost, and human capacity in business organizations.[7] Hopf has given further evidence of the general principle that with any set of conditions existing in a given enterprise, there will be a level of optimal relations to which it should aspire and which is determinable by scientific means. Evidence shows this principle to be applicable in such widely separated fields as size, cost, and executive experience, feeds and speeds in metal cutting, the motions and speeds in repetitive work, the duration and frequency of rest pauses, and the length of an assignment of work. It seems unlikely that there is any fundamental error in a principle which applies as widely as this.

CAN REST DISTRIBUTION BE MADE A PART OF THE STANDARD?

The proper distribution of work and rest should be written into the specifications for the operation, just as the correct lay-out, motion sequence, and allowed time are now specified. It will be clear that writing the distribution of work and rest into the standards differs in three ways from the ordinary fatigue allowance.

1. The ordinary fatigue allowance is not made known to the workman.
2. The ordinary fatigue allowance does not specify that rest shall be taken, unless the worker desires.

[7] Hopf, Harry Arthur. *Management and the Optimum.* New York: 1935. 40 pp. (Privately printed—presented at the Sixth International Congress for Scientific Management.)

3. The ordinary fatigue allowance does not specify when rest will be most advantageous.

The evidence from the study of output curves and work decrement shows that the proper distribution of work and rest must be determined after careful study, that it cannot be determined by the workman himself, and that output can ordinarily be increased by its proper specification. It will be clear that a workman cannot earn more bonus by working when he is supposed to be resting, though this is sometimes supposed to be the case. If the proper balance of work and rest has been specified, the daily output of the average workman will be less if he rests either more or less than the amount specified, or at any other times than those specified.

The practical problems involved in the determination of rest distribution should be given careful consideration before such a study is undertaken. Viteles and Wyatt (materials cited) offer good summaries of the chief principles involved in the practical determination of rest distributions.

Obviously, the extent to which experimental study should be undertaken depends largely upon the cost of study relative to the savings which it is anticipated can be effected. Possible savings depend upon the percentage increase in production rate which it is believed can be attained and upon the actual savings in unit costs which would result from such an increase in production. Although costs will thus be a chief concern, the improvement of morale which is usually reported following inauguration of proper rest pauses merits consideration. Wyatt says, "Although the actual increase in output following the introduction of rests may be comparatively small, it is probable that the increase in contentment alone is sufficient to justify the system."[8]

In practice, a very simple study may be profitable. In this connection Wyatt says, "If an investigation of the existing conditions of work is impossible, then the rest should be given after work has been in progress for 2 or 2½ hours. Most operatives, especially those engaged in light repetition work, are able to maintain a high rate of working for this length of time, and the result would almost certainly be an increase in production."[9]

A study may range from one as simple as this to one involving systematic experimentation with the factors influencing work decrement and extending over a period of years.

SUMMARY

Fatigue allowances can be decreased and production increased in repetitive work if the time and length of rest periods are specified in the standards instead of merely expressed as a percentage of the working time. It is usually not necessary to make elaborate physiological studies or studies of feelings of fatigue. Direct study of output curves is more satisfactory. By

[8] Wyatt, *op cit.*, p. 16.
[9] Wyatt, *op cit.*, p. 3.

such study it is possible to find an optimum length and time for rest periods. Under those conditions, production will be at a higher level than when the worker rests either less or more than the specified amount, or at any other times than those specified. These studies may be made quickly or in great detail, depending upon the practical situation. They should be included by the industrial engineer as a part of the job standardization of all repetitive work.

THE MODERN SALES MANAGER'S JOB

By BURTON BIGELOW
Consulting Sales Manager

THE job of the modern sales manager is to select intrinsically capable personnel, to train them to the highest possible effectiveness, to equip them adequately with the tools of selling, then to cooperate with them, aid and stimulate them to their peak of possible productiveness through able human leadership.

This new-day sales director does both long- and short-range planning; he goes in for field research to a sufficient extent to familiarize himself with the habits, customs and preferences of buyers and prospects; to reveal new uses of his present products and the need for new products to meet needs as yet unsatisfied; and to expose what competitors are doing.

He develops sales appeals to meet the conditions revealed by his market studies; he is familiar with common objections and resistances offered to his salesmen, and he develops effective tactics for handling them. He operates a miniature sales "laboratory" testing out these appeals on a small scale before he makes them the universal practice of the whole sales force.

He scans important field reports in their original form, but maintains a sales analysis staff to recap and analyze these field facts for his use; these he interprets and uses as constant guides for formulating new and more effective sales methods and policies. Through assistants, he projects himself into the field and onto the actual sales firing-line, where, in the person of field supervisors, he inspects, encourages and cooperates with his men to get best results.

He uses advertising as a selling force; he works with the advertising agency in close partnership, making the most of this connection; he utilizes sales promotion and home- and branch-office cooperation to aid his salesmen in the most telling ways. He once has been, and usually still is, a good salesman in his own right, able to make a creditable showing for himself in difficult sales situations—not for the sake of the actual sales volume he can close, but for the salutary influence of his example upon his men.

Above all this, the sales manager of today is a good administrative ex-

ecutive, capable of directing a large office as well as field staff, and able to manage the affairs of his division economically. Finally, he is a diplomat, as he must be in his relations with his superiors and associates in other departments, as well as in his contacts with competitors, trade association executives, members of the press and governmental authorities, of which latter class he is now compelled to meet and deal with many.

The diagram on the opposite page separates the sales manager's job into its component functions and shows their mutual relationships; reference to this diagram may be helpful in the more detailed discussion of the sales manager's task which is now to follow.

The late Norval Hawkins, one-time Ford, and later General Motors, sales manager, probably the highest paid individual ever to bear that title, defined sales management as "the art of getting *extraordinary* results with *ordinary* men." Frederick W. Taylor would today define sales management in these familiar words: "Knowing exactly what you want salesmen to do, and then seeing that they do it in the best and cheapest way."

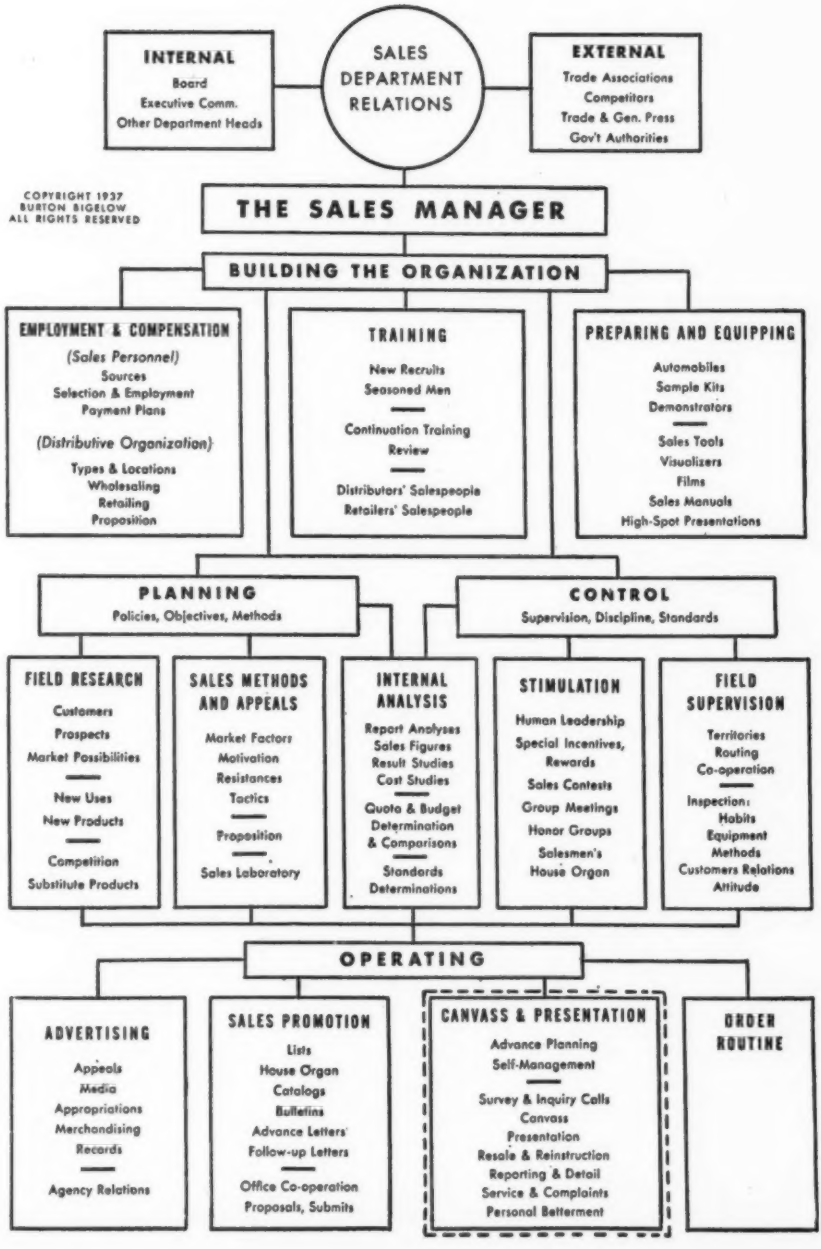
To live up fully to either the Hawkins or the Taylor definition, the sales manager who is not of the modern, but of the traditional, school must change his whole outlook upon his job. He must enlarge the concept of his managerial duties to include new and serious responsibilities, which, until very recent years, were left entirely to the salesman himself. Under the old concept, management's job was to hire the man, pay him, outline his territory, and send him forth to do the rest of the job unaided.

The modern concept of sales management, like the modern view of factory management, is to *know* a great deal more, and to *do* a great deal more than traditional sales management ever thought of knowing or doing.

SALES TRAINING

"Here's a catalog, some photographs, and there is your territory, go to it!"—was about all the training which traditional management regarded as its responsibility. From then on the salesman could and should paddle his own canoe. The old-day management would not have known *how* to train the salesman, nor what to teach him to do or to say, even if it had been disposed to take the time or spend the money to do so.

Today's management, on the other hand, knows it is not costly to train new men in right methods, but rather that it is exceedingly costly NOT to so train them. To reduce to exact figures the cost of allowing an untrained salesman to go into the field is not easy, since these costs are not segregated, but lumped with others. The costliness of lack of training results from several factors: (1) The added length of time which the untrained man requires to become self-supporting, during which time salary and expenses must be paid. (2) Sales opportunities wholly lost, or lost to competitors through the untrained salesman's inability to handle difficult situations. (3) Increased cost of field supervision during the "fumbling" period.


INTERNAL
Board
Executive Comm.
Other Department Heads
SALES DEPARTMENT RELATIONS
EXTERNAL
Trade Associations
Competitors
Trade & Gen. Press
Gov't Authorities
COPYRIGHT 1937 BURTON BIGELOW ALL RIGHTS RESERVED
THE SALES MANAGER
BUILDING THE ORGANIZATION
EMPLOYMENT & COMPENSATION
(Sales Personnel)
Sources
Selection & Employment
Payment Plans
(Distributive Organization)
Types & Locations
Wholesaling
Retailing
Proposition
TRAINING
New Recruits
Seasoned Men
Continuation Training
Review
Distributors' Salespeople
Retailers' Salespeople
PREPARING AND EQUIPPING
Automobiles
Sample Kits
Demonstrators
Sales Tools
Visualizers
Films
Sales Manuals
High-Spot Presentations
PLANNING
Policies, Objectives, Methods
CONTROL
Supervision, Discipline, Standards
FIELD RESEARCH
Customers
Prospects
Market Possibilities
New Uses
New Products
Competition
Substitute Products
SALES METHODS AND APPEALS
Market Factors
Motivation
Resistances
Tactics
Proposition
Sales Laboratory
INTERNAL ANALYSIS
Report Analyses
Sales Figures
Result Studies
Cost Studies
Quota & Budget Determination & Comparisons
Standards Determinations
STIMULATION
Human Leadership
Special Incentives, Rewards
Sales Contests
Group Meetings
Honor Groups
Salesmen's House Organ
FIELD SUPERVISION
Territories
Routing
Co-operation
Inspection:
Habits
Equipment
Methods
Customers Relations
Attitude
OPERATING
ADVERTISING
Appeals
Media
Appropriations
Merchandising
Records
Agency Relations
SALES PROMOTION
Lists
House Organ
Catalogs
Bulletins
Advance Letters
Follow-up Letters
Office Co-operation
Proposals, Submits
CANVASS & PRESENTATION
Advance Planning
Self-Management
Survey & Inquiry Calls
Canvass
Presentation
Resale & Reinstruction
Reporting & Detail
Service & Complaints
Personal Betterment
ORDER ROUTINE

To avoid these losses, modern management offers salesmen training of a fairly broad scope; the subjects usually include:

Markets—Prospective purchasers
Company—History and policies
Products
- Conception, invention or discovery
- Raw materials
- Manufacturing processes

Product-in-Use Applications
Product-in-Use Results
Customers—Experiences and attitudes
Competition
Sales Methods
- Preparation
- Canvassing
- Approach
- Qualifying
- Presentation
- Demonstration
- Objections
- Closing
- Call-backs and follow-up calls
- After sale service
- Complaints and adjustments

The broad scope of this modern type of coaching is alone enough to distinguish it from the traditional "training"—if such it could be called—of the old school. The latter almost invariably overemphasized product information, and almost completely ignored the equally important subjects of product application, product results, customers and sales technique.

Under the traditional type of sales direction, even if the president, for example, was intrinsically the company's best individual salesman, he seldom knew HOW he sold; and even when he did know, he rarely took the time or made the occasion to reduce his own methods to anything resembling a recorded and teachable technique. In fact, most above-average salesmen with the old-school background will insist that each successful man must sell according to his own understanding and capacity; that one man's methods cannot be reduced to technique and taught to another so that the latter may make effective use of them. This, however, is not a new point of view—it has been encountered by everyone who has attempted to substitute, either in the office or the factory, an ordered method for the so-called "inspirational individualism."

Modern sales training is characterized by the observance of many important lessons learned from sales coaches of long experience. No longer does the company bring its best salesman in from the field, and make him, willy nilly, the official sales trainer. It has been discovered that he is not a teacher; that he cannot reduce his own methods to organized training material; and that he is not happy in a job for which he has not the slightest natural bent or actual experience.

Here are some of the important angles given attention by the new-day training:

First: A field study is made of the salesmen's habits and practices, to determine what bad habits are to be eradicated; what omissions are to be remedied; and what practices are to be encouraged and further developed. In a refrigeration survey, for example, it was found that the retail dealers' sales people were informed on product sales points in only 30 per cent of the establishments. Of these, it was found that 65 per cent failed to distinguish between prospects on the important points of money, size-of-family, and immediate intention to purchase. Seventy per cent of the men found ordinary, everyday objections disturbing, and of these, over half were unable to handle the objection and get smoothly back again on the main track of the sales talk. Two still more amazing discoveries resulted from this survey: 65 per cent of the sales people surveyed did not trouble, or did not know how, to get the prospect's name and address; also, of those who did get the name, 90 per cent failed to follow up the lead in the home.

With such facts—and numerous others which are automatically revealed by a thorough survey—at hand, it is much easier to plan a sales-coaching clinic which is tailor-made to fit the needs of the particular sales group.

Second: The novices are placed in classes separate from the veterans, so that neither the ignorance of the one, nor the hard-boiled sophistication of the other will interfere with progress.

Third: The coach strives for a high degree of student participation, to avoid the dulling monotony of the old-style "pouring-it-in" type of lecture.

Fourth: Discussion or forum periods are planned to follow each lecture, so that individual expression may be had, and new ideas and methods exposed for all to comment upon.

Fifth: Mimeographed or printed summaries of lectures are given out at the close of each session, so that the student is not required to remember the entire lecture; and so that he can review the subject matter at his leisure. We find that salesmen often keep this printed material for many months; in some cases, we have had examples of men carrying the material with them on interviews and actually reading to prospects whole paragraphs of pertinent material taken from their training course.

SALES TOOLS

Old-fashioned management furnished practically no sales tools—no sales manual, no visualizer, no fact book, no slide film. If a salesman wanted selling tools, he built his own, and since he manifestly had little time in which to do this, he usually went into his sales battles empty-handed.

Modern viewpoints will not risk the costly results of this hit or miss type of selling; they equip their men with every possible tool, even to sound movies, in order to make their salesman's story more vivid, more convincing, more interesting. The sales tools of today often serve several purposes—as continuation training courses, as sales presentation devices, as store houses of information—all in handy indexed and ready-reference form so that the

salesman can find the right material instantly when he needs it most in his interview.

No mechanic is required to work without tools, and few of them are required to build their own. Why should a salesman in the field, hundreds of miles from headquarters, be comparatively less well-equipped for his work than the mechanic back in the factory?

FIELD RESEARCH

Traditional management never bothered with research, believing that the salesman needs few facts, and what he needs, he can dig out for himself, just as he can build his own sales tools.

Modern sales management, on the other hand, insists on knowing. One large and exceedingly successful firm, using scientific management methods in its sales work, catalogs the name and address of every possible prospect in the country. They assign each prospect a rating based upon his potential buying power, as calculated from the previous year's purchase of their type of product. With these unit facts as a basis, it is easy to calculate the total market potential of each salesman's territory.

SALES LABORATORY

Modern sales management insists upon knowing the relative effectiveness of various sales appeals. New appeals or new combinations are tested by selected men in a limited territory; when they have been proved, these appeals are relayed to all the salesmen through the continuation training program so that a continual improvement is always in process. Aside from its primary value in improving the salesmen's effectiveness, this freshening of sales material accomplishes a great deal in building salesmen's morale. Always a part of any sales appeals study is the consideration of recurrent sales objections and resistances. These uncovered, new and more effective ways of handling them are developed, tried out and sent on to the men in the field.

Under this "laboratory" sales policy, the best ideas and the most successful methods of the top-notchers become the universal procedure for all. Contrast this with old-day methods where sales methods were the well-kept secrets of the individual salesmen, and where management, knowing next to nothing about how to sell its own product, was constantly at the mercy of the salesmen in the field.

SALES ANALYSIS

Modern sales management leans heavily upon sales analysis—the study of report recaps, and the figure facts of sales and sales costs. A dairy and poultry feed manufacturer had been assigning quotas on the rule-of-thumb basis of a vertical increase over last year's results. After a study, we pointed out the rather obvious flaw in this plan that it took no scientific notice of the differences in the market *opportunity* of the various territories. Fortunately, reliable data were available on which a market opportunity study could be

based. Completed, this analysis revealed that not a single quota figure established by the traditional method represented the correct percentage of volume for the territory. As a result, the quota figures were revised to reflect the more scientific findings of the market opportunity study. Of still more importance, the salesmen thereafter were judged, not on tonnage alone, but on the kind of a job done in relation to the territorial opportunity.

In another case, a simple sales analysis study revealed that every active dealer, on the average, was worth $2,000 per year in sales. Examination of the call report summaries showed that, on the average, one dealer was sold out of every eighteen called upon. Thereafter, it became a simple matter to increase volume by the process of asking each man to make one additional dealer call per day. Not one man objected to this slight additional work. Theoretically, every eighteen days, each man closed a new dealer, and thus added a potential $2,000 to his annual sales. Actually, the men did better than the sales figures had forecast. Result: An increase in total sales of more than $800,000 in twelve months at practically no increase in total sales cost, and at a reduction in unit cost.

Sales analysis gives the sales manager of today recaps of the figure facts of sales, cross-analyzed to reveal every fact of management value. These include summaries of costs and profits and analyses of each individual salesman's production, expense records, sales of profitable and unprofitable lines, and detailed studies of the component elements of sales costs. Out of these figure studies, accurate sales quotas and budgets are built, and standards are arrived at. These standards provide handy yardsticks for measuring sales effort, sales production, and sales costs. As an aid to planning, and as a tool of sales control, sales analysis is one of the indispensable functions of sales management.

STIMULATION

The Taylor principle of extra-pay-for-extra-work is applied with splendid results by the modern sales manager. Where the old-type sales management resisted all forms of special sales compensation as likely to add to the cost of selling, the modern sales director uses special payment plans, as Taylor did, to reduce the unit cost, to build morale, and to keep the sales force in a happier state of mind.

The basic human habit or failing which makes special stimulation a necessity was never better stated than by Taylor, who said: "There is no question that the tendency of the average man (in all walks of life) is toward working at a slow, easy gait, and that it is only after a good deal of thought and observation on his part or as a result of example, conscience, or external pressure that he takes a more rapid pace."

Astute sales managers use all of the incentives mentioned by Taylor—they rely upon example, prod the conscience of the guilty, and press the indolent or careless. The sales contest or competition is usually the vehicle by means of which these ends are accomplished. The tactics however, are

frequently changed. One contest will have a straight volume objective; another will reward men for those intermediate steps which inevitably lead to volume—such as calls, presentations, demonstrations, etc. Still another contest will pit two well-matched groups, one against the other, in which case the groups themselves often put up some "side bets" as prizes to heighten interest. Later contests will reward men for pushing slow-moving lines, for reclaiming lost customers, for driving hard on new items, for signing up the largest number of outlets, for selling the complete line, for making early morning, or after-supper calls, for the best showing in off-the-main-line sales, for reducing expenses over all or in some special classification.

Whatever the human weak spots in the sales organization, whatever the bad habits the sales manager wishes to correct, or the new habits he wishes to inculcate, he finds that the persistent use of incentives and rewards will do much to accomplish any legitimate management end.

In addition to special rewards and incentives, stimulation as a part of the sales manager's job, includes the best aspects of personal leadership. It may include Hundred Point Clubs, Top Notcher's Clubs and many forms of special honor groups. It certainly will include some interesting form of frequent contact with the men in the field. This may be a mimeographed bulletin or a printed salesmen's house organ, but whatever the form, contact will be maintained frequently.

The most valuable contribution to able sales management is successful human leadership which only the right individual can supply. This requires inspiration, consideration, discipline. Fairness in giving a man the benefit of the doubt in a borderline situation; refraining from "riding" him in a pinch; small acts of personal friendliness and sympathy which establish a bond of friendly feeling between men and manager—this constant procession of little things, hard to describe and difficult to define, constitutes the best possible stimulus for salesmen—and the modern manager uses these incentives liberally.

FIELD SUPERVISION

Supervision of salesmen in the field receives much attention from the up-to-date sales manager. Taylor, it will be remembered, found most manufacturing plants to be grossly under-officered from the point of view of utilizing the principles of scientific management. Even in the more modern sales departments, this criticism still is pertinent. In most companies, the field force is too loosely, too remotely, and too infrequently contacted and supervised even by a second- or third-string executive. Modern management recognizes that salesmen require more or less field supervision, depending upon several factors, including the type of product, the compensation plan, the size of the territory, the geographical density of the calls, and the types of buyers and prospects.

A house-to-house crew selling books, aluminum ware, vacuum sweepers, refrigerators, hosiery or brushes—to mention some well-known types—need

the close supervision of a block man having not more than seven men under him. In fact, he will often get better results, as modern management has discovered, if he is required to supervise no more than three to five men. This close supervision does not increase, but actually decreases, the unit cost of selling.

Today's management requires that the typical field supervisor be part sales coach, part manager, part inspector. He represents management when in the field, and when he returns to his office, he represents the men to the management. The field supervisor helps the salesman on tough calls, brings him news of new methods—other men's successful ways—serves, in short, as a sort of "human house organ." In behalf of management, the field supervisor checks the salesman's habits; inspects his equipment, including his samples, demonstrators, and his sales manual; observes his attitude toward his customers and toward the company, and helps him to adjust complaints and render service.

ADVERTISING AND SALES PROMOTION

The modern sales department knows how to use advertising, how to manage it, and how to deal with the advertising agency to get the most from its services. The sales manager, in many organizations, is quite rightly the overlord of the advertising function, even though he has under him a competent advertising manager who is a thorough technician and detail man.

Advertising, from the sales manager's point of view, is best defined as a process of mass pre-selling. From the salesman's point of view: "Advertising is the salesman's partner. It helps to separate the prospects from the suspects; it informs the sincere; it breaks through indifference, and aids in developing latent wants. It predisposes the prospect in favor of the salesman's product and his house, and lightens the labor of his job."[1]

The sales promotion activity is under the closest scrutiny of sales management. Mailings, bulletins to prospects, the consumer house organ, letters in advance of salesmen, and letters to follow up their calls, office cooperation on proposals, submits, etc.—all these activities are closely tied into modern sales management.

In fact, modern sales management leaves only one major task for the salesman—that of face-to-face presentation of the sales story, which we call here canvass and presentation. In this activity, it aids the salesman through training to acquire right habits of work, it cooperates with him so that he shall become a better self-manager, and it aids him to make accurate and meaningful reports about his activities. But the one job which management does not undertake is that of personally contacting the prospects and buyers whose dollar constitutes the *pièce de résistance* of the whole selling process.

In other words, this new-day management employs, compensates, trains, equips, plans the market strategy, devises the sales appeals, stimulates the men

[1] "The Salesman's Definition of Advertising," from *The Knack of Selling More*, by the author. McGraw-Hill Book Company, New York.

to greatest effort, supervises their activities, supplies them with advertising on a large scale, and with sales promotion and cooperative office effort—and although spending three or four times as much money on the overhead or management end of selling, it buys its sales in much greater volume at much less unit cost than did the old-style management where the salesmen did everything but hire and pay themselves.

TIREDNESS

By JAMES H. TAYLOR, Ph.D.
Cincinnati, Ohio

WHILE objectively observable work decrement and experimentally ascertained fatigue have received considerable attention in the last two decades, little has been written about the more strictly psychological problem of tiredness. Accordingly, we wish to state in this paper some generalizations concerning tiredness; then to suggest, on the basis of these generalizations, some means to minimize, and in some cases, to eliminate reports of tiredness.

Tiredness is not an event which can be observed accurately by a spectator. It is a report which the individual makes concerning his own estimate of his own condition and, as such, is a purely personal matter. We dare not confuse tiredness with physiological fatigue, which is an energy depletion or deprivation phenomenon. Neither must tiredness be confused with work decrement, which is a fall in observed and recorded production rate. The fact that subjects continue to report increasing tiredness, even though their production rate remains the same or greater, was first shown experimentally by Poffenberger.[1] Later, Lewin[2] showed that when his adolescent subjects were required to read the same poem over and over, the mental breaking point (or the report of extreme tiredness, which was labeled "psychic satiation") appeared long before any loss in amount of work recorded. In a recent investigation by Taylor, Thompson and Spassoff[3] subjects reported at the end of three hours of continuous work that they were too tired to finish their assigned task (that of conducting small slugs through a series of pathways) yet for another full hour after this report their production rate grew steadily greater.

These studies show that tiredness is not causally related to fatigue and work decrement, but they fail to show that tiredness never accompanies a fall in production. Quite frequently reports of tiredness are associated with a decided loss in production rate and an increase in those products custom-

[1] Poffenberger, A. T. *Applied Psychology*, New York, 1927, p. 135.

[2] Lewin, K., "Untersuchung sur Handlungs-und Affektpsychologie." V. Karsten, A. Psychische Sattigung. Psych. Forsch. 1928, 10, 142-254.

[3] Taylor, J. H., Thompson, C. E. and Spassoff, D., "The Effect of Conditions of Work and Various Suggested Attitudes on Production and Reported Feelings of Tiredness and Boredness," *Journal of Applied Psychology* (in press).

arily designated as the indicators of fatigue. The important point is that such an alliance is not causal, universal, or necessary.

Tiredness is not boredness. While it is impossible to devise an experimental proof of this generalization, an analysis of our everyday experiences seemingly bears it out. One may be quite fresh as he briskly walks along the avenue, yet the conversation with the slightly deaf old lady may become distinctly boring. Likewise, one may be tired out after a day of hard work, yet find the school-day account of his young son immensely interesting. It is timely to note that, while tiredness and boredness must be considered as independent variables, the treatment for them is almost identical; and that many of the studies which purport to investigate boredness or monotony actually are dealing with tiredness.

Tiredness is a learned response. Just as the individual learns, somewhere between the ages of one and three, to say "I am hungry" when certain changes take place in his body, he learns to say "I am tired" when he has developed the ability to interpret his own muscular condition. Very young children and very young animals will continue expending energy until sheer exhaustion takes place. Those of us who have seen young children stay up to play, long after a proper bed time, have noted, to our dismay, what profound and sudden changes may take place in the internal economy of a child who, ten minutes before, was re-enacting the afternoon football match. The maturing individual learns to anticipate this exhaustion. He begins to recognize certain signals from his muscles as evidence that his energy supply is nearly depleted. He says he is tired and, if he can, rests his muscles until the tiredness warnings again disappear. It is quite possible that after a certain critical age, say about ten years, the vast majority of people never experience anything near dangerous exhaustion. The importance of this fact is that, since tiredness is a learned response, it can be modified.

The individual becomes so accustomed to saying that he is tired when he discriminates these signals from his muscles that he will say he is tired even when he has been doing no work. The student who sits at his desk to do an hour of uninteresting work sometimes finds himself too tired to begin. He is paying too much attention to himself. Try a simple demonstration of this fact. Shut your eyes and attend as carefully as you can to the calf muscles of your legs. Move these calf muscles slightly. Shut out everything else—lights, sounds and thoughts. Soon your leg muscles will begin to ache. This is because there are always signals coming from these muscles unless they are perfectly relaxed. Usually we are so busy that we pay no attention to them. But when we do notice them we reason that we are tired, simply because the signals are the same as those which occur when we work our muscles too much. These signals are of import to the individual as fatigue warnings only when they occur with such strength and frequency that they are noted despite the demands of other pressing external conditions.

Psychiatrists long since discovered that the typical hysterical patient

who proclaimed many and grievous ills could be "cured" if he were occupied with external events. Weir Mitchell, one of the most successful of early psychiatrists, believed that the chronic fatigue so frequently reported by neurotics was due simply and purely to their habit of observing their own normal muscle tensions. Jacobson[4] made use of this fact by teaching neurotics first to observe closely and to identify these muscle signals and then to relax these muscles so the signals were no longer initiated. Once this relaxation was learned the reports of chronic tiredness disappeared.

It follows, then, that these signals of oncoming, or present, muscular fatigue may be disregarded if there is sufficient external attraction to occupy the attention of the individual. The typist may complain about her tiredness at the end of the day and really feel sufficiently exhausted to seek an early bed. But the telephone rings, hasty preparations are made, and she is off to an evening of dancing. Not once does she mention her tiredness—she is too busy with other affairs to pay attention to her muscles.

The writer and a group of associates[5] instructed a group of six girls, who were working for a four-hour continuous period on an automatic, repetitive task, that they should not talk to one another, sing, or whistle. For the first two hours their production rates remained almost constant, while they reported more and more tiredness. Due to the fact that it was next to impossible to restrain one girl from talking, all the girls suddenly began to chatter, to hum, and to sing. Almost immediately the production rate began to rise, the girls reported more and more freshness, and at the end of the work period actually reported less tiredness than they had at the beginning of the experiment.

Somewhat the same phenomenon was noted by Wyatt[6] in his study of incentives in repetitive work. When the girls in the experimental group, working at their regular job of packing and weighing candy, were paid on a straight time rate, each girl receiving exactly the same amount per hour as the others, reports of tiredness and boredness were frequent; while capacity to work, as measured by production, was little impaired. When the girls were placed on a piece-rate system, their interest in their work grew (since they had little time to think of anything but the demands of the immediate task) and reports of boredness and tiredness reached a new low.[7]

Nevertheless, these signals from the muscles are reliable indicators of oncoming fatigue if the individual has been working his muscles to some untoward extent. Sometimes external events partially rob the individual of

[4] Jacobson, E. *Progressive Relaxation.* University of Chicago Press, 1927.

[5] Op. cit.

[6] Wyatt, S. "Incentives in Repetitive Work," Industrial Fatigue Research Board Report No. 69, 1934.

[7] Wyatt notes that while reports of boredness and tiredness were minimized under the piece rate system, capacity to work, as measured by production, was impaired, after an initial rate which was much higher than that recorded in the straight time or in the bonus system. He suggests that this is due to physiological exhaustion. This is a dangerous assumption to make, in the absence of supplementary physiological measures. The decrement in production might be due to any one of many factors, as the presence or absence of supervisors, the knowledge that so much time had passed or that so much work had been done, etc. About all that one can infer directly from a decrement in a production curve is that there has been a decrement.

his ability to interpret signals which are proclaiming a dangerous approach to physiological deprivation, and which should be heeded as definite orders to rest. Young[8] writes of John Coulter who, in 1806, was forced by hostile Indians to run the gauntlet. He was given a hundred yards start. The young bucks of the tribe stripped themselves of all incumbrances, save their weapons, then gave chase. After running at full speed for over two miles, one of Coulter's pursuers far outdistanced the others. Coulter's strength had begun to fail "and blood gushed from his nostrils." He stopped, hurled his enemy to the ground, and killed him. He picked up a spear as lawful spoil, and "feeling, as he said to me, as if he had not run a mile," ran two more miles to a river, where he dove far under the water and up under a beaver house, which the Indians passed by in the excitement of the chase. Certainly this extraordinary man had reason enough to report tiredness, yet he felt "as if he had not run a mile" when his attention was diverted from himself to the excitement and possibilities of escape. Coulter was physiologically exhausted by this chase, as subsequent examination proved. While in his case it was hardly the thing to attend to his muscle signals, rather than to the more immediate business of getting away, they were accurate indices of his muscular condition.

Within the last few years in the U.S.S.R., a worker, by name of Stahkanov, "discovered" a new system of increasing work production. *Stahkanovism,* which employs as its primary principle the continuous use of machinery by the group method of alternating working periods, is said to have increased production to over five times the original amount, in some cases, with no added strain to the workers. Unbiased reporters[9] claim that the workers are so imbued with their discovery, and the resulting glory showered from Moscow that they fail to note an exhaustion which is only marked by increased accident rates, absences, and evidences of sabotage committed by some of the less enthusiastic citizens.

We, through long experience, have learned that tiredness usually occurs after we have worked or played for a considerable period of time; consequently after a certain amount of time has elapsed since the beginning of our work or play we actually begin to feel tired. It is the clock-watcher who is the most tired. If workers can be removed from the presence of a clock, they lose accurate time reference and, as a direct result, report less tiredness, produce more. Spassoff,[10] working with members of a cast in a college dramatic production, held them in a trance for as long as three hours while they practiced their parts, and told them they had been asleep for fifteen minutes only before he awakened them. These subjects awoke feeling fresh and ready for further practice, while the other members of the cast were tired out from their arduous tasks.

---

[8] Young, P. T. *Motivation of Behavior,* New York, 1936, 99, 433-436.

[9] *Time Magazine,* December 16, 1935.

[10] Spassoff, D., "The Effect on Hypnotized Subjects of Removing Time Reference." Unpublished Report, Wittenberg College, Springfield, Ohio, 1935.

Finally, there is a special sort of tiredness which deserves brief comment. Individuals are accustomed to associate relaxation with rest. Hence, when they are relaxed they may be expected to report that they feel tired, and that further rest is needed. Jacobson[11] found that his subjects felt it necessary to tense their muscles after they had been relaxed, in order to eliminate a feeling of tiredness. This is due to two major factors: first, usually we are relaxing after a period of work which has induced tiredness, hence the association between the two variables is strong; second, we have been taught, at home and in school, that efficiency is dependent upon attention, and that attention means the maintenance of a tension in the muscles. This dual fact is so well established that even after subjects have completely relaxed for an hour (a rest which is known to be equivalent to a good four-hour sleep) they report feelings of tiredness and lack of vigor. This loggy feeling of tiredness, apparently the customary aftermath of relaxation, disappears entirely when specific instructions postulated by Jacobson are followed.

Basing the procedure on these general principles, a step toward doing something about tiredness may be taken. Since each case will present its own problems for study, the following recommendations must be considered as general suggestions only, not applicable to every situation.

Management will do well to examine more closely the plaints of tiredness made by workers. It is certain that these signals of oncoming tiredness anticipate actual physiological exhaustion far sooner than is practically necessary. This does not mean that the worker's condition should be ignored, but it certainly does mean that the investigator should substitute objective measures for the thoroughly unreliable subjective report. As early as 1868, Ranke showed that fatigue is not dangerous until sarcolactic acid ($C_3H_6O_3$), mono-potassium phosphate (KH_2PO_4), and carbon dioxide (CO_2) are present in the blood stream. While this study is difficult to make, and is infrequently made, the general conclusion reached by Ranke still stands. Subsequent students have found that lactic acid is always present after strenuous exercise, and that the amount may be taken as a fairly accurate indicator of the state of the organism. Two tests which are more simple to administer, but which are less reliable, are the measure of the pulse rate and of touch sensitivity. The first test is based on the assumption that as the organism tires, more and more blood must be pumped to the muscles; hence, there is an increase in circulatory rate. The second test is predicated on the laboratory studies of physiologists who noted a decrease in nerve transmission after work and, accordingly, a decrease in the accuracy of judgments depending upon the transmission of nerve impulses. Regardless of the inaccuracy of these tests they are many times more reliable than the totally untrustworthy verbal report.

The work situation should be arranged so that the worker is primarily concerned with external events rather than with his own condition. This

[11] Op. cit.

may be done in two ways: first, by arranging the operations so that the worker is not unduly conscious of his own movements; and, second, by arranging the working situation so that external events are more demanding than the processes of the individual's own condition. While only a cursory examination can be made of each one of these points, the following suggestions have been confirmed either experimentally, or in an actual work situation.

1. If the movements made by the operator in performing his duties are of a sort to produce an increasing tension, unpleasantness will result to such an extent that the worker's attention will be forced on himself. In the psychology laboratory it has been established that the experience of pleasantness is invariably bound up with movements which produce relaxation of the muscles, while unpleasantness is associated with movements which increase the tension.[12] Wyatt[13] notes that many work movements are either short or jerky, such as in shoveling or in wrapping packages, or are sustained, such as the posture of the operator in feeding an automatic machine. In play, long, complete movements are made. The Gilbreth's doctrine[14] of long sweeping movements—a concept which was originally designed to eliminate fatigue rather than unpleasantness—hit upon this same fundamental.[15]

The importance of this point is that every job on which tiredness (or any other introspective feeling, such as dreary reverie) is reported, should be motion-studied to ascertain the possibilities of so changing the movements as to incorporate the long, relaxing variety, and to eliminate the choppy, jerky order.

2. The working condition may be socialized, so that the individual is more intent upon the activities of other people, rather than on his own processes. Evidence to support this point has long been present in the form of laboratory reports, but only in recent years have such findings as those in the Hawthorne experiment under Mayo[16] and in the studies of Wyatt in several British industries lent practical acceptance to advantages of socialized effort. The results are consistent in showing that working together in a social group aids production, reduces accidents, minimizes complaints of all nature.

It is obviously impossible to produce the social situation in all working conditions; hence, sometimes, other steps must be taken. It has been pointed out by several investigators that there is a particular personality which is eminently fit for lone work, provided the work is made automatic enough to permit the worker to dwell on his own thoughts almost exclusively. This means, first, that there must be incorporated into the employment process some means of selecting these individuals who are impervious to the mo-

[12] Rose, H., "Der Einflusz der Unlustgefuhle auf den motorische Effekt der Willenshandlungen." Arch. f. d. ges. Psychol. 1913, 28, 94-182.

[13] Op. cit.

[14] Gilbreth, F. B and L. M. *Applied Motion Study*, New York, 1917.

[15] Hartson, L. D., "Analysis of Skilled Movements," *Personnel Journal*, 1932, 11, 28-43.

[16] Mayo, Elton, *The Human Problems of an Industrial Civilization*, New York, 1933.

notony of repetitive work, and, second, jobs which are almost automatic must be made completely so, either by special training or further mechanization. Employment managers have not at the present time suitable methods for determining what characteristics of the worker lend themselves best to this sort of work, but by judicious inquiry a final, satisfactory array may be arrived at.[17] The important thing at this date is to recognize the problems; at a later time industrial psychologists will have answers for them.

3. Another means to combat the deadening effects of repetitive work, with its accompanying attention-to-self problems, is to introduce external factors which will divert the worker's attention, and in brief, entertain him. The reading, out-loud, of newspapers in hand-wrap cigar factories, the use of radios in assembly rooms, the establishment of group singing along an automobile assembly line are suggested examples. There has been no evidence brought forth to show that this sort of treatment increases production, but it is quite certain that morale, or the worker's way of looking at himself and his job, is improved. Geise[20] took pictures of workers who were doing a mechanical job of packing. When marches and jazz music were played the pictures show happy and cheerful faces and, with familiar songs, evidences of group singing. Naturally, the demands of the external situation cannot be too exacting, or the workers will drop their tasks completely.

In the packing room of a large dental manufacturing company, radios were introduced as a means of building up worker morale. The instant success of this move led the supervisors to install radios in all departments of the company, save the offices. It is reported that even clerks working with figures are not distracted from their work, as long as the selected programs are confined to music, and speeches are avoided.

Periodic rest periods can be arranged, during which time the workers can relax, and thus eliminate the signals of tiredness which emanate from tired muscles. But it is important to note that complete relaxation must be learned before it is effective, and it is equally important to stress that relaxation practiced during the rest period can be carried over into the ensuing work period. The question of the length of the rest period, the proper point of its insertion, and like problems must be determined by individual experiment. However, in summarizing the result of extensive industrial research in the U.S.S.R., Shustin[21] has set several principles, most of which have been previously stated at different times by various American

[17] Some of these characteristics of the worker who can best work alone are fairly well known, but a complete picture is lacking. Burnett[18] in a minor study with too few subjects, showed that an average intelligence is better than too high or too low intelligence. Thompson[19] has shown that susceptibility to monotony is inversely related to emotional instability; the more stable the individual, the less susceptible he is to montony. This last point is supported by recent disclosures in the American automobile industry which point to the fact that the phlegmatic, self-contained type best stands the pressure of the machine-controlled assembly line. While not experimentally shown, it is quite possible that the introverted individual, who finds pleasures in building air castles, would be less likely to revolt against repetitive work.

[18] Burnett, I., "An Experimental Investigation Into Repetitive Work." *Industrial Fatigue Research Board Report No.* 30, 1925.

[19] Thompson, L. A. "Susceptibility to Monotony." *Personnel Journal*, 1929, 8, 172-196.

[20] Geise, F., "Berufspsychologische Beobachtungen in Reichstelegraphen-Dienst." Shrift. z. Psych. der Beruf. u des Wirt. 1923, 24, 1-74.

[21] Shustin, N. A., "Labor and Rest." Psychophysiol. Ind. Work. Leningrad, 1936.

and British investigators, which may be observed: First, the rest period should never be less than ten minutes in length. Second, two ten-minute rest periods are more efficient than one twenty-minute period. Third, the noon lunch-hour should not be considered as a rest period. Fourth, the rest period should not be "earned," but should be allotted to everyone, regardless of his production record. Fifth, the action of workers during the rest period should be controlled in order to guarantee equivalent rest to all concerned.

It is this last point which has special reference to our problem of eliminating tiredness. The first recorded instance of an attempt to control the method of rest was that of Mayo[22] in 1923. In a study at a textile mill, Mayo introduced rest pauses, and at the same time the men "were instructed in the best methods of gaining the maximum of muscular relaxation." Just what techniques were used in this study are not clear, but in the last ten years excellent methods have been made available. These methods have been fully explained by Jacobson.[23] With a competent instructor in charge fairly effective general relaxation can be taught to groups of individuals in three or four periods of 15 minutes each. This training can be supplemented by further survey of printed directions which the worker can study at his leisure at home.

It is quite obvious that if tiredness is dependent in large part upon the discrimination of signals from muscles, then if these muscles be trained to relax so that no further signals can originate in them, tiredness must be greatly minimized. And if in conjunction with the training of this method, further training in the development of proper work motions can be combined with attempts by managements to externalize and to socialize working conditions, it is quite possible that tiredness and boredness will cease to be matters of industrial concern.

SALARY SAVINGS

By LLOYD W. KLINGMAN, C.L.U.

THE Salary Savings, Payroll Deduction, or Salary Allotment Plan of life insurance has during the past ten years assumed a position of importance in employer-sponsored insurance and thrift plans. Its rapid growth even during the depression has been due in large measure to a clear understanding of the plan by personnel heads and to their recognition of employees' needs. This interest in salary savings has been extended by the adoption of the plan by several nationally known concerns in the last three years.

The plan of salary savings is relatively simple. An employee is enabled to purchase permanent life insurance by means of monthly premiums of nominal amounts which his employer deducts from his pay and remits directly to

[22] Op. cit.
[23] Op. cit.

the insurance company. The employee owns and controls his own policy and enjoys the same privileges as do all other individual policyholders. His application for insurance is usually considered on a non-medical basis, a satisfactory personal history questionnaire establishing his insurability. Any employees having poor medical histories, or engaged in hazardous occupations, may be required to undergo a full medical examination. A fixed minimum number of participating employees is necessary to put the plan into operation. Ordinarily, the employer does not contribute anything to the payment of his employees' insurance, though recent instances have indicated a trend on the part of some employers to share in a part of the cost, basing such contributions on the employees' length of service.

An actual survey by many personnel departments revealed an appallingly small percentage of employees who owned any personal life insurance. The Equitable's Group Department found that of the hundreds of thousands of employees covered by group insurance, nearly 45 per cent had no other insurance and an additional 33 per cent had less than $1,000 of insurance, the latter generally represented by industrial policies. The startling point in this revelation is that this condition prevailed among the "white collar" groups as well as among industrial workers.

A survey of a large banking institution and a fire insurance company disclosed that only 20 per cent of their employees owned as much as $1,000 of personal insurance; and, in a plant manufacturing electrical equipment, the percentage was even lower. Another firm whose personnel comprised a majority of college-trained individuals presented the same general picture.

What are the reasons for this situation? They may briefly be summarized as follows:

(1) An inadequate conception of life insurance.
(2) The need of a practical monthly budget plan for buying family protection.
(3) Company restrictions which shut off qualified insurance underwriters from contact with employees.
(4) Inadequate incomes of rank-and-file employees to meet the relatively larger premiums, on the quarterly, semi-annual or annual basis, for regular policies of insurance.

Everyone is familiar with the trend of instalment-plan buying that has swept the country during the past two decades. Nearly every marketable product has been offered on this budget-payment basis to induce *immediate* purchase, thus obviating the necessity of a long wait until it could be completely paid for in a lump sum. This tendency to "mortgage" future income naturally led many wage-earners to indulge in luxuries beyond their means, or needs, and overshadowed the necessity of protecting a part of that income for their dependents should death suddenly intervene. The lack of a workable budget method for buying life insurance exposed them to this temptation of instalment commitments, often for foolish luxuries. It might be said,

therefore, that the salary savings insurance plan was needed to offset the competition of that famous lure of "only a dollar down and a dollar a week" method of purchasing less important services.

Since nearly all wage-earners must calculate current expenses in terms of their monthly compensation, the principle of budget-buying has always been inextricably involved in their expenditures. The familiar bills for rent, light, gas and telephone must be paid monthly. After these items and the general maintenance needs of the family are provided for, it is perhaps only the unusual family that will manage to save for quarterly or semi-annual life insurance premiums. Since they are accustomed to *monthly* disbursements they prefer to make all payments on that basis.

As a general rule, the employee in industry is approached through the industrial debit agent, who has perhaps already succeeded in placing small weekly premium policies on his wife and children. The amount of the father's policy on his own life in most cases is small—often not more than enough for burial expenses and while such policies have helped to liquidate "last illness" debts, they have rarely met the more vital needs of the family after the breadwinner's decease. Consequently, salary savings insurance has been most effectively sold to the employees on its assurance of *continuing his wage or salary* for a minimum of one or two years after death.

From the analyses already made, it would seem that two fundamental courses are necessary, not only to impress upon the employee his responsibility to his family, but to help him to do something definite about it. One is an organized employer-controlled program under which intelligent underwriting service is made *available* to the employee, although his use of it is entirely voluntary. The second is the automatic "painless" method of direct payroll deduction of the premiums involved. The latter part of the plan is in keeping with the employee's general method of budgeting his expenses on a *monthly* basis—and emphasizes as well the old axiom that "money that does not get into our hands we never miss."

That an employee needs expert advice on the amount and kind of insurance he ought to buy has long been recognized. His few dollars must be invested to the greatest advantage, and only experienced agents with a thorough understanding of employees' problems can give him the sound advice he needs. Consequently, before any salary savings plan can be effectively installed, an underwriter must be selected in whom the employees can have complete confidence. High pressure salesmanship is absolutely taboo. An earnest, intelligent and comprehensive explanation will always be the controlling factor.

The actual method of installing salary savings is an interesting one. The usual procedure is for the employer to permit the insurance underwriter to interview, in a private office, on company time, each employee who is interested in knowing about the plan. During such an interview the underwriter explains the advantages available under the plan, and, also, that the partici-

pation of the employee is entirely voluntary. In advance of actual solicitation of individuals, foremen and department heads meet with the underwriter, the plan is outlined and a program of procedure set up; and when the underwriter gets to a particular department, the department head arranges for the discussion with employees. Once the installation is made, the underwriter generally appoints a time to be in the plant, and employees are encouraged to bring their insurance problems to him without obligation.

In the Equitable's experience of over ten years in this particular field, and with over $200,000,000 of salary savings insurance in force, an interesting point is that of all the employees who have purchased it, 52 per cent had no life insurance other than group insurance. This proves that a considerable number of employees, who had inadequate insurance, were glad to avail themselves of the plan *when they were given the opportunity to do so.*

Industrial employees of the grade of laborers, porters and railway section hands are not outstanding prospects for salary savings insurance. The majority of people who will participate are among the more highly skilled craftsmen, department heads and office employees. The main reason for the exclusion of certain industrial classes is their lack of sufficient income and the high occupational ratings it might be necessary to impose. In some cases an entire organization may be eligible for salary savings insurance, while in other instances the number of employees who could participate might be relatively small. To cite two typical cases: A bank or trust company would be likely to have a large percentage of employees favorably disposed to salary savings; whereas a steel mill, employing thousands of workers, might have only a few hundred who would be interested in the plan. To put it another way, salary savings plans will appeal primarily to the higher organization groups and will not interest many of the workers in the lower wage brackets.

It is interesting to note the type of policy an employee usually purchases under this plan. As might be expected, he generally wishes to provide a maximum amount of insurance for a minimum outlay, in as much as he has very little, or no other, insurance. The most popular policy among employees is the familiar ordinary life policy, and it has been found that 60 per cent of participants in salary savings have purchased that contract. This form, however, has during the last two years been supplemented by a contract combining life insurance and an annuity, which form matures as an endowment at the older ages and runs automatically into an annuity for the insured's own benefit. The twenty-payment life policy is also a favorite.

The real success of salary savings is manifested by the recorded statistics showing the number of re-sales to employees who had previously participated in the plan. We have found that a satisfied employee will add to his insurance program as time goes by; in fact, during the past year, 25 per cent of the participants were those who already owned a salary savings contract. Some have as many as eight or ten contracts, all purchased on the monthly payroll-deduction basis.

There has been a little confusion in the minds of some as to just where salary savings insurance takes its place among the insurance and thrift programs of industrial and mercantile firms. From our own observation it has definitely been established that the salary savings plan is always a desirable supplemental program, for even if a firm already has instituted group life insurance, the salary savings plan will complement that program and fill up any possible gaps in the insurance coverage. Group insurance is primarily blanket indemnity—while salary savings provides for the specific needs of individual cases. The group life insurance coverage offers a maximum protection at a minimum outlay for all—leaving those employees who can afford an extra outlay a margin to be put into *personal* salary savings. Thus each of these plans has a definite place in any set-up for employee-welfare.

A potent influence in the future development of salary savings is the enactment of the social security law. When employees, particularly those in the higher income brackets, recognize the insufficiency of the income provided under the Social Security Act, they will immediately realize the necessity for making provision for a supplemental income. An ideal method adopted by many employees is the use of the combination insurance and annuity contract mentioned previously, which not only gives protection to the insured's dependents before his retirement, but at the retirement age of 65 gives the insured himself a guaranteed life income—which dovetails perfectly with the benefits he receives under the Social Security Act. This method has a particular appeal to employees in the salary classifications of over $3,000 a year, for under the Social Security Act their benefits are limited to a sum less than their earning capacity.

Many firms, we find, which have heretofore harbored a prejudice against payroll deductions of any kind, are now manifesting increasing interest in such plans of insurance to supplement the deductions called for under the Social Security Act.

In this connection, the question may well be asked: What maximum percentage of an employee's income should be put into such welfare plans? Obviously, the total of 3 per cent tax under the Social Security Act may vitally affect the ability of the lower-wage employee to put more into personal insurance. From the better paid worker, however, we may expect little objection, for if it is necessary for that individual to adjust his spending to lesser income, he will do so rather than risk, or eliminate, his savings. According to a study by *Business Week,* mentioned in the issue of September 7, 1932, it is established that the average individual's ability to *save* grows in proportion to the increase in his income.

The possible effect of social security on employees may well be illustrated by one of our large railway salary savings franchises. When the Government Pension Act for Railway Workers, originally based on a 2 per cent deduction, went into effect, we lost only three participating employees out of more than a thousand. Later, when the present plan of 3 per cent tax was sub-

stituted, we had no cancellations whatsoever! Hence we contemplate the Social Security Act as a favorable influence in the further development of salary savings business.

One of the first organizations to adopt salary savings for the entire personnel was the American Telephone and Telegraph System. They have had the plan in effect for over ten years, and in many of their subsidiaries they report as high as 60 per cent of the eligible men participating. As was expected, the percentage of telephone operators entering the plan has been very small, due of course, to their average younger age and lower wage scale. Some other representative organizations that have adopted the plan are: Westinghouse Electric & Manufacturing Company; E. I. du Pont de Nemours & Company, Inc.; Chase National Bank; Southern Pacific Railway Company; American Mutual Liability Insurance Company; Philadelphia Electric Company; Insurance Company of North America; George A. Hormel & Company; Associated Gas & Electric System, and the Guaranty Trust Company.

With this roster of representative industries already enjoying the advantages of salary savings, we feel encouraged to predict even greater advance in the future for this form of insurance coverage, redounding not only to the benefit of employees, but employers as well.

EMPLOYMENT TESTING

By WALTER V. CLARKE
Manager, Psychological Testing Division, R. H. Macy & Co., Inc.

MANY inquiries have been received, during the past few months, concerning test methods and results. Some of these question the value of a testing program, while others are interested in how such a program may be incorporated into the present employment procedure. All admit the need for some improved, scientific method of selecting applicants for positions. With the present rise in employment, it has become increasingly important that some efforts be made to apply the methods of scientific selection to industry as a whole.

No two human beings are alike and it may be said that no two jobs are alike. If this were entirely true, the task of accurate selection would be humanly impossible. But even though no two individuals are exactly alike, they may be similar in many ways, and, of course, many jobs prove to be similar. Typists as a class must be able to operate a typewriter with a satisfactory degree of efficiency. Book salesmen as a class must be able to sell books. Experience has shown that almost anyone can do almost anything but only a few can do some of these things well. Whether this is due to heredity or environment, talent or training, is no concern of the employer. What the individual can do or can be taught to do in the least time, with the greatest efficiency and most satisfactory results to all is important.

There are, therefore, two problems of testing involved. The first and simplest is the measurement of achievement or ability to perform some task for which the applicant is already trained. Such positions as comptometer operator, typist, and stenographer illustrate this type of job. To prepare an adequate test of relative ability in typing is, primarily, the administration of a standard job to all applicants and the measurement of their relative achievement.

The measurement of the individual's capacity to learn a job or the possibility of his advancement to a better position is much more difficult. In this case it is necessary to determine fundamental aptitudes and to relate these aptitudes to the job. These two problems are, therefore, the essence of modern psychological testing.

WHY TESTS FAIL

There are many reasons why a testing program in industry might prove unsuccessful. The men who developed psychological testing were educators; their problems involved the measurement of factors involved in education. When these tests were applied to industry, they were unsatisfactory. It was necessary to develop an entirely new type of test for this new field. The difficulty was that very few industries were willing to become "white rats" for the experimental procedures necessary to devise these new tests, with the result that business still fears the "experimental" nature of testing.

During the post-war period of interest in the possible use of test methods in industry and the vogue for the new psychology, many pseudo-psychological systems such as phrenological readings, character judgment through analysis of physical characteristics and other similar devices spelled the temporary doom of legitimate scientific selection by their extravagant claims. Couple this with the inherent inertia of an established system, the human aversion to change, and the necessity of experimentation without guaranteed returns; it is little wonder that business avoided the use of scientific selection for so many years.

THE PSYCHOLOGIST IN INDUSTRY

If psychological selective methods are to prove satisfactory, it is most important that industry realize the importance of having a trained psychologist in charge of the testing program. The same men who delegate the responsibility of the testing department to a lay person would demand the services of the best surgeon for even a minor operation or hire highly trained experts to analyze and develop the products of their company. The very nature of psychological study requires careful training and wide experience. It cannot be emphasized too much that the use of psychological selection techniques in industry requires the services of an individual trained not only in the field of psychological method and statistics but also in the school of business experience. An intimate knowledge of jobs, of job conditions and of the employee as a human being, obtained only by working with these

conditions, should be an important part of the training of the industrial psychologist.

Not only should the psychologist study and administer the testing program, but he should be called upon to study those personnel problems involving activities of the human mechanisms of the plant in the same way that the engineer is called upon in the study of the inanimate machine. It has been interesting to see the mental localization of the psychologist in industry in the general field of employment testing. The reason for this apparent specialization is due, no doubt, to the great and popular development of tests. Undoubtedly, employment testing is a highly important part of the psychologist's work in industry but other less highly advertised functions also deserve consideration. In this way the psychologist may be continually useful to the organization even though the problems of employment are not sufficient to warrant the expense of full-time employment. The main problem today is to find psychologists who are qualified for such industrial work.

When the decision to use the method of scientific selection of new employees is made, since testing is merely the application of the scientific methods of quantification to the qualitative evaluation of the interview, it will be necessary to make a complete psychological analysis of the job, prepare trial tests and statistically evaluate them before the actual testing program can be put into effect. A description of how this was done in a particular situation will demonstrate the general method and the often forgotten fact that science is, after all, only applied common sense, standardized and analyzed.

HOW TESTS ARE MADE

One of the important jobs in a retail store is that of cashier. The particular qualifications of an individual who is to have a high degree of accuracy and speed are not immediately obvious; especially in the case of those who work in the tube rooms, to which carriers are continually being fed through intricate pneumatic tube systems. When the request came for a battery of tests for the selection of applicants for such a job, it was necessary to carefully observe the mechanics of the job and study the factors of intelligence and personality which had proven satisfactory in past experience.

From the results of such a study, the job was broken down into three major abilities:

1. good manual dexterity;
2. an ability to check incoming saleschecks for error; and,
3. ability to make change.

It was also found that too high, as well as too low, an intelligence level was not conducive to steady work. Individuals of high intelligence, however, are completely satisfactory for short-time temporary placement. The

factor of personality was found to be of importance in that the introverted person was usually unsatisfactory. Day-dreaming and cashiering are not compatible. There are, therefore, two general factors which may be measured by general standardized tests.

It was then necessary to devise adequate measures for the three specific factors. The first of these, manual dexterity, required a test of activity as nearly like the actions used on the job as possible. Strange as it may seem, manual dexterity varies widely with the muscle groups involved and a judgment of general dexterity from any one test is not valid for other manual skills on a job. The dexterity test, therefore, was devised on the motions of pick up, carry, open, close and place a number of cash carriers. This test was scored in terms of speed.

The test of checking ability was conceived as a series of completed problems, some of which were incorrect, with instructions to write the correct answer if an answer was wrong. Four minutes were allowed for this test and scored in terms of the number of correct responses. The change-making test was merely a standardized series of problems involving the actual making of change. This was scored in terms of time and errors.

The tests having been selected, it was necessary to determine the critical scores for hiring. This was accomplished by testing a group of applicants and applying the statistical techniques necessary to determine norms for the general population. When it became necessary to hire a number of new or temporary cashiers, these tests were administered. After a sufficient period had elapsed so that adequate records of production and valid judgments of success were available, ratings were made on each of these persons. These criteria were correlated with the tests, and the value of the individual test, as well as the battery as a whole, was calculated. The validity of the tests having been determined, the tests were then officially accepted for the selection of cashiers.

These tests are not a panacea for all employment ills. They do not eliminate the interview, the personal evaluation of experience, or judgment of the social conduct which is so important on many jobs. They do eliminate those who are incapable of doing a good job because of a lack of ability to perform the major functions of the job. The best recommendation for testing is the satisfaction expressed by department heads and by reports, such as occurred in the case cited above, that errors were reduced about 30 per cent under the previous year when selection had been based mainly on interview.

The ability to predict with a fair degree of accuracy the progress of an individual on a job, and to place that individual where he can perform most efficiently and with the greatest pleasure and satisfaction, enables the personnel officer to feel that through this one procedure he has solved many of his problems of future employee relationship and has improved the efficiency of the organization.

HELPING THE INJURED MAN BACK TO WORK

By CARL NORCROSS
Rehabilitation Division, New York State Education Department

AMERICAN business firms spend millions of dollars annually on accident prevention work, but once the accident has occurred, is it a wise policy to let a twenty-dollar-a-week clerk direct the company's policy toward the injured worker? Unnecessary delays, extended litigation, antagonized employees, compensation neuroses and great expense are some of the consequences.

Safety work, important as it is, is not enough. After accidents occur, an intelligent plan must be started immediately to help the injured man return to his jobs; he needs the active help of the personnel department. Careful supervision of the injured person pays dividends both in cash and in improved morale. The accounting story of personnel replacement costs is too well known to need emphasis. If the injured man can be put back to work promptly enough a substitute may not need to be employed.

The shorter the period of absence, the less workmen's compensation will need to be paid. With self-insurers, or in instances where compensation rates are lowered with decreased accident costs, a direct financial savings follows.

The injured worker who feels sure that the company is looking out for his welfare, and who knows that the firm is with him rather than against him, will remain loyal for years. There will be no need for him to prolong his compensation by stalling, because he will feel confident that his job, which invariably brings a greater financial return than compensation, is ready for him as soon as he can resume work. However, industrial firms should cooperate with the injured man primarily because it is a decent, humane act to help a man up when he has been knocked down rather than because such cooperation will save money or win loyalty.

It is probable that most personnel managers will approve the above theories. "Of course we cooperate with the injured man!" they say. But with many firms, the cooperation lies in turning over the entire affair to an insurance company. There are several ways in which real help can be given the injured person. When the accident has occurred, make sure that competent medical attention is given. You can save money in the long run by a little judicious spending. In some states the employer has nothing to say about the choice of physicians, but this is not generally the custom. Get the best physician you can. He will be able to differentiate between unimportant and really serious conditions. Proper treatment given early in the case is always of the greatest value.

Traumatic neuroses are the bugbear of workmen's compensation. Yet often they can be prevented by a sane attitude on the part of the first physi-

cian who treats the man. A rough, harsh-mannered physician who has become so calloused from handling industrial accident cases that he answers, "Bosh. Nonsense. Just imagination!" to the suggestion that a neurosis is beginning to develop, will build up enough resistance and neurotic conditions in your injured workers to cost you a pretty penny.

Just as it is important to employ capable physicians, so it is of equal value to put a man in charge of your after-accident supervision who has more than average intelligence and who measures up to high standards for personnel workers. This is of the most vital importance. Many firms make the mistake of believing that two $1,200 clerks can turn out twice the work of one $2,400 employee. This may be true of envelope addressers, but not of personnel workers. Supervisors with sound judgment are needed. A capable liaison supervisor could save his salary several times over in the handling of compensation cases.

Don't treat the injured man as though he were a criminal, or scold him with, "This is the kind of thing that raises our insurance costs." He probably didn't want to have the accident, and it may have been your foreman's fault that conditions permitted it. If it was his fault, there will be time after he has recovered to point out his mistake.

Make sure the injured man gets regular compensation. Do your best to see that he doesn't have to wait weeks or months for his first check or that there are long intervals between payments. Don't take the attitude that payments are none of your business or that you can do nothing about them. Your firm is paying premiums to protect your workmen. Be sure they get what you pay for. The lack of prompt and regular payments does more to antagonize injured workers than almost anything else.

If a large firm is a self-insurer, it controls many phases of the relationship with the injured man which cannot be done by a firm dealing with an insurance company. For the self-insurer, there is no excuse for inefficient handling. But even the firms working through an insurance company can exert a beneficial influence. One familiar with the high personnel standards of some large firms is amazed at the indifference sometimes shown to the injured employee. "Let the insurance company handle him," is the attitude. And the insurance company, with thousands of injured workers on its rolls, often mis-handles him.

After competent medical attention has been given, and regular compensation paid the injured worker, the personnel department can cooperate in several other ways. Put the employee's mind at rest about his job. If he was worthy of hire at the time of his employment, he is worth saving. He will not relax unless he knows his occupational future is secure. Anxiety is the most common symptom of neuroses, and this worry can be alleviated if the injured man knows his job is safe.

This is not the place for an extended discussion of the causes of neuroses. Very briefly it can be said that neurologists admit that there are some per-

sons who are potentially neurotic, and any obstacle may serve as the immediate cause of the neurosis. For such persons, the accident is an excuse for not going on to face the harsh realities of life, whatever they are, financial failure, or a dominating wife or mother-in-law. The proportion of such persons is not high, and an injured worker seldom goes off in the corner and has a neurosis all by himself. Most neurotic conditions following accidents are caused partially at least by outside events acting on the worker. Many traumatic neuroses are preventable. If, as neurologists say, the basis of a neurosis is anxiety and fear, make certain that nothing you or your representatives do will originate or continue the anxiety.

Personnel departments can make sure that complete and adequate records are furnished the insurance company and the state workmen's compensation bureaus. Sometimes delays occur because state officials are not sure about payroll amounts, number of hours worked per week and other relevant data on which compensation rates are based. If the employer is asked to attend a formal hearing to give evidence of any kind, delays should not occur because the employer is indisposed to be present. Delays are always injurious to the claimant.

Help the employee to get back to work as soon as medical advisers recommend it. The sooner the man gets back to work, the less chance he will have to forget his work habits. Work is an amazingly fine therapeutic device. Even if the injured man cannot go back to his former work immediately, provide him with light work. In addition to giving him a regular routine, which is beneficial, you may be helping him to exercise stiff muscles. Useful exercise on the job is infinitely better than what the injured men often feel is purposeless exercising on contraptions in the hospital.

Personnel departments can often use the services of the state rehabilitation departments. When an employee suffers from an accident which disables him so seriously that he cannot go back to his old job, he may be able to do other work. Rehabilitation workers, experienced in analyzing physical requirements for jobs, could walk through a plant and discover several kinds of work which the injured man might do. If training is necessary, the rehabilitation bureau can provide it at no cost to the claimant.

In most industrial states, the rehabilitation bureaus have considerable funds for re-training injured workers. If a machinist, for example, loses several fingers on his left hand and cannot go back to such work, his experience and education may qualify him for work as a draftsman if he has some concentrated training. The state could give him the necessary training and the man could return to his old firm. The records of the various state rehabilitation departments are filled with case histories of men who have been aided in returning to employment. The wise use of state rehabilitation resources is one of the best ways in which personnel managers can help the injured worker.